

Rock Products

DEVOTED TO
Concrete and Manufactured
Building Materials

Vol. IX.

CHICAGO, ILL., FEBRUARY 22, 1910.

NO. 8.

CAROLINA PORTLAND CEMENT COMPANY

We are the largest distributors of Portland Cement, Lime Plaster, Fire-brick and General Building Material in the Southern States, and have stocks of Standard Brands at all of the Atlantic and Gulf Seaports, and at our interior mills and warehouses, for prompt and economical distribution to all Southern territory. Write for our delivered prices anywhere. Also Southern agents for the "Dehydratine's" waterproofing material. "Universal," "Aeme" and "Electrod" Brands Ready Roofing. Get our prices.

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DEXTER Portland Cement
THE NEW STANDARD
Sole Agents SAMUEL H. FRENCH & CO., Philadelphia



UNION MINING COMPANY

Manufacturers of the Celebrated

MOUNT SAVAGE
FIRE BRICK
GOVERNMENT STANDARD.

DEVOYE a special department to the manufacture of Brick particularly adapted both physically and chemically to

Lime Kiln and Cement Kiln Construction

Large stock carried. Prompt shipments made. Write for quotations on Standard and Special shapes, to

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Mount Savage, Md.
CAPACITY, 60,000 PER DAY.
ESTABLISHED 1841.



BEST BELT
FOR GRIFFIN,
TUBE AND
BALL MILLS
Oak-Tanned

Chicago Belting Co.

CHICAGO, PHILADELPHIA, PORTLAND, ORE., NEW ORLEANS.

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BEST BELT
FOR
DAMP
PLACES



ALMA Portland Cement

STANDARD BRAND
OF
MIDDLE WEST.

Specially adapted to all Reinforced Concrete and High-Class Work.

ALMA CEMENT CO.
WELLSTON, OHIO.

How do you figure your Lime Kiln, Rotary Cement Kiln and other furnace expenses and charges for Refractories? By the cost of the BRICK, or by the length of the service they will give?

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CHROME }

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Are made of the highest grade raw materials under expert supervision, in modern up-to-date works, and are worth more because better than others. They last longer and are more economical. You can prove this statement in your own works by sending us a trial order. Information, records and prices on request.

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PROMPT
SHIPMENTS

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Manufacturers of
MATCHAM BRAND
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WORKS:
EVANSTON, PENN., on P. & R. RY.
Capacity 1,000,000 Bbls. Yearly.



A PERFECT RECORD FOR TEN YEARS
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"THE BEST IS THE CHEAPEST"

Address
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PORTLAND CEMENT
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Strength
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A Dependable Portland Cement

An Unblemished Record for six years speaks for itself

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Stone Crushing, Cement and Power Plants

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"LEHIGH" PORTLAND CEMENTHigh Tensile Strength, Finely Ground
Light and Uniform in Color.

Manufactured by the

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Western Office:
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Capacity, 8,000,000 Yearly.

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85% Thru 200

98% Thru 100

UNIFORMLY 10% FINEST GROUND CEMENT MANUFACTURED

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Savannah, Natl. Bank Bldg.**"CHICAGO AA"**

1,250,000 Barrels Annually

HIGHEST QUALITY
"THE BEST THAT CAN BE MADE"

"Chicago AA" Portland Cement is best adapted for use in making concrete because of its absolute uniformity, fineness, prompt hardening and attractive color. "Chicago AA" is second to none, and every barrel is fully guaranteed to meet the requirements of the Standard Specifications.

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108 La Salle St.

Booklets on Request.

Chicago, Ill.

**The Waterproofing
That Waterproofs**

"Te-Pe-Co," the No-Oil Mineral Liquid Compound, makes all kinds of concrete and masonry waterproof for all time. Don't fail to see our exhibit at the Cement Show.

"Te-Pe-Co" is the one reliable waterproofing compound for cement and concrete work. It is a scientific combination of mineral and chemical substances. It comes to you all ready for use. You run no risk of spoiling it by wetting it or mixing it with something else.



Simply stir it, take an ordinary paint brush and apply it. No expert needed. In its liquid form it will seep deeply into the pores of the concrete, brick or stone. Then, in a few hours the liquid will evaporate, leaving only the mineral substance to dry out and harden in the pores, thus closing them forever.

With the pores of concrete and masonry closed, moisture can never enter. That's all that any waterproofing solution pretends to do—simply closes the pores. Oil will close them for a time. Wax will close them for a time. Grease will close them for a time. But a mineral that has filled them and hardened in them will close them for all time. "Te-Pe-Co" is such a mineral.

REMARKABLY LOW COSTIt costs only $\frac{1}{2}$ of a cent to waterproof a square foot of surface.

That's the first cost and the last.

There is no after expense—no "doing it all over again" at the end of a year or two. Once make a structure waterproof with "Te-Pe-Co," and it will remain so until the structure is destroyed.

SEND FOR SAMPLE

Write to-day for particulars, prices and evidence in abundance—or, better still, send us \$1.00 and we will ship one sample gallon of "Te-Pe-Co," the regular price of which is \$1.50 (for single gallon).

The National Water-Proof Co.663 Harvester Building
Chicago, Ill.

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Rock Products

DEVOTED TO
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Volume IX.

CHICAGO, ILL., FEBRUARY 22, 1910.

Number 8.

CONCRETE IN LARGE FACTORY CONSTRUCTION

Automobile Establishment in Boston has Recently Completed a Model Plant,
Safe, Permanent and Economical.

By E. S. LARNED, C. E.

In the development of fireproof manufacturing plants, concrete has come to occupy the front rank by reason of its strength, rigidity, structural adaptability and unexcelled fireproof qualities. For heavy floor loads and long span construction, concrete also enjoys economic advantages, in addition to its superior fireproof qualities, over slow burning mill construction, so that ample reason is found for its extensive use, particularly in industries where the fire risk and attending damage must be reduced to a minimum, also where the limit of column spacing, to secure ample floor space, is of prime importance.

Careful consideration of the requirements of his extensive and growing business led Mr. Nichols to adopt reinforced concrete.

The building, containing 43,750 square feet of floor space, is located on Ames street, opposite Princeton avenue, on the Cambridge side of the Charles river basin, "between the bridges," one square back from the Esplanade, with the broad side toward the river, and is conspicuous for several miles from the river bank of the Back Bay section of the city proper.

The plant, one of the most complete of its type in New England, and comparing favorably with any similar establishment in the country, is designed for

the manufacture and repairing of automobiles in every main branch of construction. The equipment, in every detail strictly modern and on a large scale, consists of a forge plant and machine room, battery and charging outfit, body and coach making department, upholstery and trimming rooms, paint shop and temporary storage. It will be all contained in the four-story structure illustrated herewith.

The present business of the company consists of building, handling and repairing commercial motor trucks of various capacities, from 1,000 pounds to five tons, designing and building bodies and all appointments for pleasure and public service cars.

Foundations.

In this locality the ground is filled with material taken from the river bottom nearby. The entire building is supported on piles, which were driven to a depth of about 14' below the ground level, or 17' below the street grade. The piles rest on a stratum of stiff clay below which it would be necessary to drive a distance of approximately 70' to satisfactory bottom. The load was made, consequently, L_{nat} , being about twelve tons per pile. The piles were cut off at grade 12, Cambridge base, this being the water

level of the Charles river basin, and at this grade the tops of the piles are 8' below the first floor grade; under these conditions it was found cheaper to support the wall columns on individual foundations than to put in a continuous foundation at this depth. Reinforced concrete beams between the wall columns 4' below the finished grade of the building support the curtain walls.

Engineering and Construction Details.

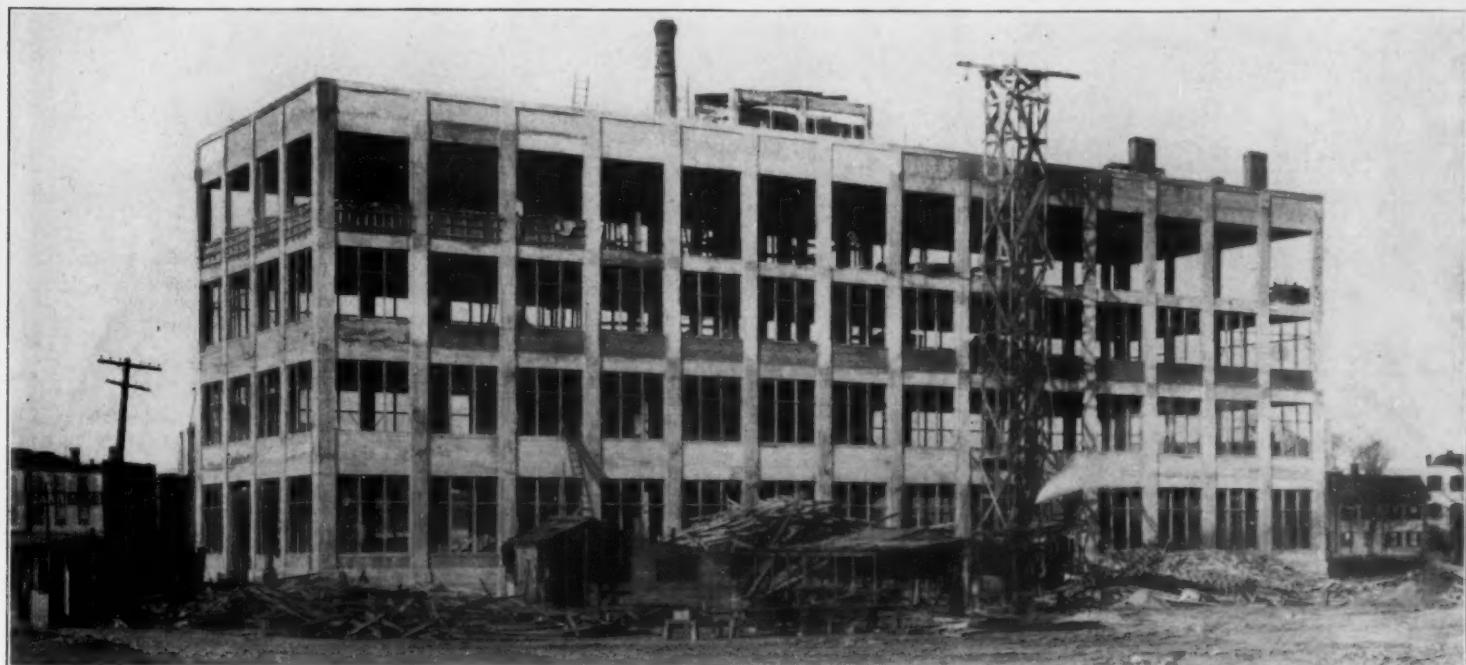
The building is of the beam girder construction, with clear spans of 25'x25'. It is 175' long by 50' in width. The first floor is built on the ground, and there are three constructed floors and roof of the same strength; the clear headroom on the first floor is 12', and 11' on the second, third and fourth floors.

The design was based on a distributed loading of 125 pounds per square foot, with allowance for a concentrated load of 3,000 pounds.

The maximum light is obtained on account of the large window area, this composing 58 per cent of the wall surface. The windows are fixed sash, arranged with a swinging transom at the top, by which sufficient ventilation can be obtained.

Since the interior columns would be extremely large

(Continued on Page 58.)



D. P. NICHOLS & CO.'S NEW CONCRETE FACTORY BUILDING AT BOSTON, MASS., IN COURSE OF CONSTRUCTION.

POWER AND MINING MACHINERY COMPANY

More McCully Triumphs

ROCK CRUSHING
MACHINERY

CEMENT MILL
MACHINERY

MINING MACHINERY



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PRODUCERS

WOOD IMPREGNAT-
ING PLANTS

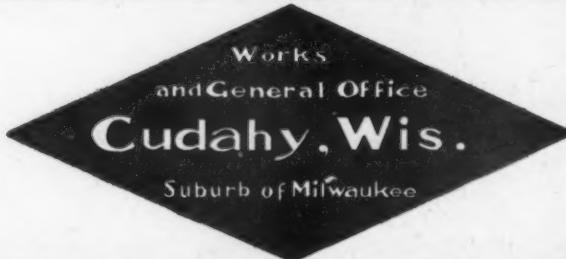
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TING MACHINERY

The months of December and January were two of the biggest months in the point of McCully crusher orders booked that we ever had. People who know want the McCully. People who are not so well posted investigate, and then buy the McCully. We are ready to tell you more about this famous machine.

Write for Catalog 4 R. Rock Crushing Machinery.

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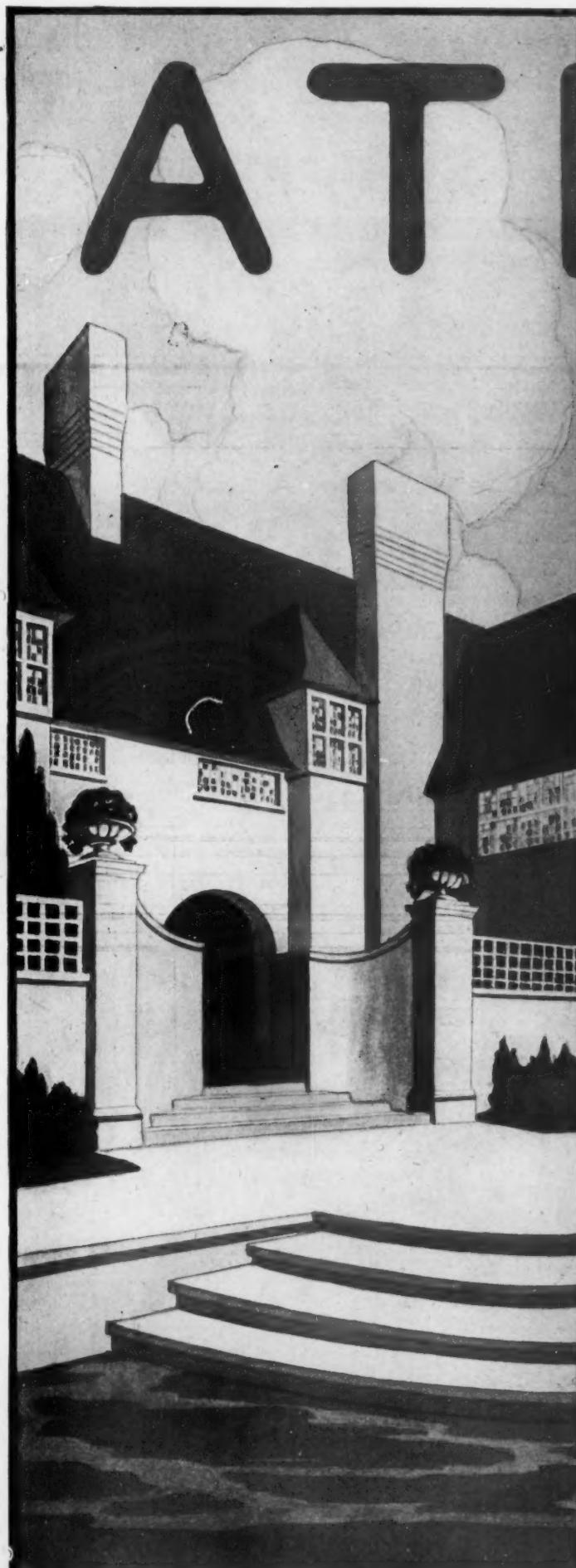
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These books contain many half-tone cuts (in tints) of photographs together with floor plans of concrete houses ranging in price from \$1,000.00 to \$450,000.00.

The houses not only show a large variety of designs, but are of several different methods of concrete construction. They are not imaginary sketches, but have been built and designed by the best architects in the country. Vol. 1, Large Houses; Vol. 2, Small Houses. Size, 10x12 inches. Copies will be sent, express prepaid, upon receipt of \$1.00 per volume.

"Concrete Country Residences" (out of print.)
Price \$2.00.

"Concrete Cottages."

A sixteen-page pamphlet showing photographs, floor plans and specifications for small concrete houses ranging in cost from \$1,500.00 to \$4,000.00. Copies free upon request.

"Concrete Construction About the Home and on the Farm."

The 1909 edition of this book contains many half-tone cuts from photographs showing several new and practical uses of Portland Cement about the home and on the farm, besides full directions for making and handling concrete; also many specifications, sectional drawings and photographs of the smaller constructions that can be built by the layman. Copies sent free upon request. Cloth bound copies, 25 cents.

"Reinforced Concrete in Factory Construction."

A book containing besides several general chapters on concrete, concrete aggregate, methods and materials for reinforcement, ten chapters, giving detail descriptions of ten concrete factories and warehouses erected in various parts of the country by different systems. Photographs, sectional drawings and specifications were furnished by the engineers in charge of the work. Paper copies, delivery charges, 10 cents. Cloth bound copies, 50 cents.

"Concrete in Railroad Construction."

A text-book for railway engineers, containing detailed descriptions, drawings and many photographs of railway construction in which concrete is used. This book will be sent free only to railroad officials, and railroad engineers. Price, \$1.00.

"Concrete in Highway Construction."

A text-book for highway engineers and supervisors. It contains complete descriptions, drawings and photographs of every phase of highway construction in which concrete plays a part. It is the most valuable book ever published on this subject. Sent free only to highway officials and highway engineers. Price, \$1.00.

"Concrete Garages."

A valuable book for any one contemplating the construction of a garage. It contains photographs of many concrete garages, together with sectional drawings and detailed descriptions as to how they may be constructed. Sent free upon request.

Atlas Portland Cement is made from genuine portland cement rock; the cement that is always pure and uniform and made only in one grade; the cement that makes the best concrete; the cement of which the U. S. government bought 4,500,000 barrels for use in building the Panama Canal.

THE ATLAS PORTLAND CEMENT CO.

Dept. U, 30 Broad St., New York.

Daily productive capacity over 50,000 barrels—the largest in the world.

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DEALERS and CONTRACTORS desiring to give their customers and clients the highest possible quality—always uniform, always better than the standard specifications, always prompt setting and hardening, always beautiful color, always of high strength and sand carrying capacity, always sound and always reliable, always recommend

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We have largely increased our capacity and shipping facilities, insuring continuation of the superb service given our customers in 1909—Annual production now 1,250,000 barrels.

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City Concrete Sewer, Wesley Hospital Addition,	North Chicago, Ill.	Emerson M. Manufacturing Co., Factory Bldg.	Rockford, Ill.
Denkmann Memorial Library,	Oak Forest, Ill.	Lewis Knitting Co., Factory Building,	Janesville, Wis.
Carson, Pirie Scott & Co., (Reinforced Concrete Warehouse)	Waterloo, Ia.	Marsh Place Co., Factory Building,	Waterloo, Ia.
Northwestern Malt & Gr Co., (Reinforced Concrete Grain Elevator)	Chicago, Ill.	Griswold Wire Works, Factory,	Sterling Ill.
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		Macleable Iron Range Co., Factory,	Beaver Dam, Wis.
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		C. B. & Q. Ry.	

There is a heap of satisfaction in getting the quality you can sell to your friends and retain their friendship; that is the kind of business we are after—business that we can have year after year. We can always strain a point to increase our capacity to take care of your order and the quality will always be the same, "THE BEST THAT CAN BE MADE"

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Works, Oglesby, near La Salle, Ill.

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SOME IMPORTANT WORK WHERE MARQUETTE CEMENT HAS BEEN USED

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Cargill Elevator, South Minneapolis	12,000 bbls.
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Office Building, People's Gas Light & Coke Co., Chicago	20,000 bbls.
Chicago City Hall	22,000 bbls.
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U. S. Navy Department, North Chicago, Training Station, North Chicago, Ill.	40,000 bbls.
American Bottle Co., Streeter, Ill.	16,000 bbls.



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HIGHEST STANDARD

DAILY CAPACITY, 6000 BARRELS



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ROYAL IS PERFECTION

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 Waterproofing Exhibit
 at the Cement Show

BAY STATE
 BRICK AND CEMENT COATING
 as a Protection and Tint for Concrete

This Coating is made of a cement base, held in suspension by a volatile oil which evaporates on application. It contains no lead, is not affected by fumes of acids or gases and can be applied to a damp surface. It becomes a part of the material itself and will not rub, crack, peel, chip off or mildew.
It does not destroy the desirable distinctive texture of concrete.



writers as a fire retarder and will lessen the Insurance rate. As a floor coating it prevents the powdering of cement floors, making a sanitary application for public buildings, hospitals, schools, libraries, etc. It can be readily washed. It will not chip or scale off when applied overhead and thus prevents damage to delicate machinery.

Ask your dealer or address for sample card and particulars.

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 Paint and Varnish Makers and Lead Corroders
 98-99 Washington Street, Boston, Mass.

"Science Bids Dampness Defiance"
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The Best Waterproofing on the Market

The Salvation of the Cement Block business depends on a
Reliable, Cheap Waterproofing

We have it. Costs but 15 cents per gallon.

Formula (shop right) for sale.

Send for information and sample stone treated with this process.

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**The Wisconsin Lime
& Cement Company**

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This means that IT IS the BEST and SUREST
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BERKSHIRE IS USED FOR ALL OUTDOOR AND INDOOR WORK
 WHERE A PERMANENT PURE WHITE EFFECT IS DESIRED

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**WATERPROOFING COMPOUNDS
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Damp and Water-resisting Paint. Waterproofs structures from cellar to roof.

SYMENTREX

(Liquid Concrete)
 Beautifies and waterproofs brick and concrete surfaces.

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This compound makes concrete impervious to water.

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The Perfect Waterproofing for All Kinds of Concrete Work

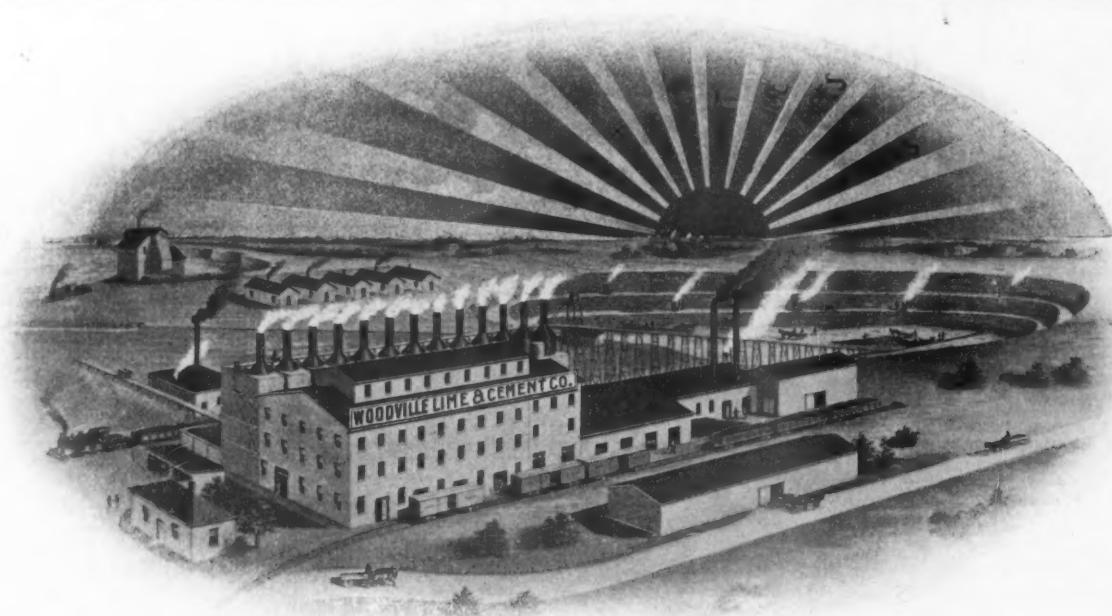
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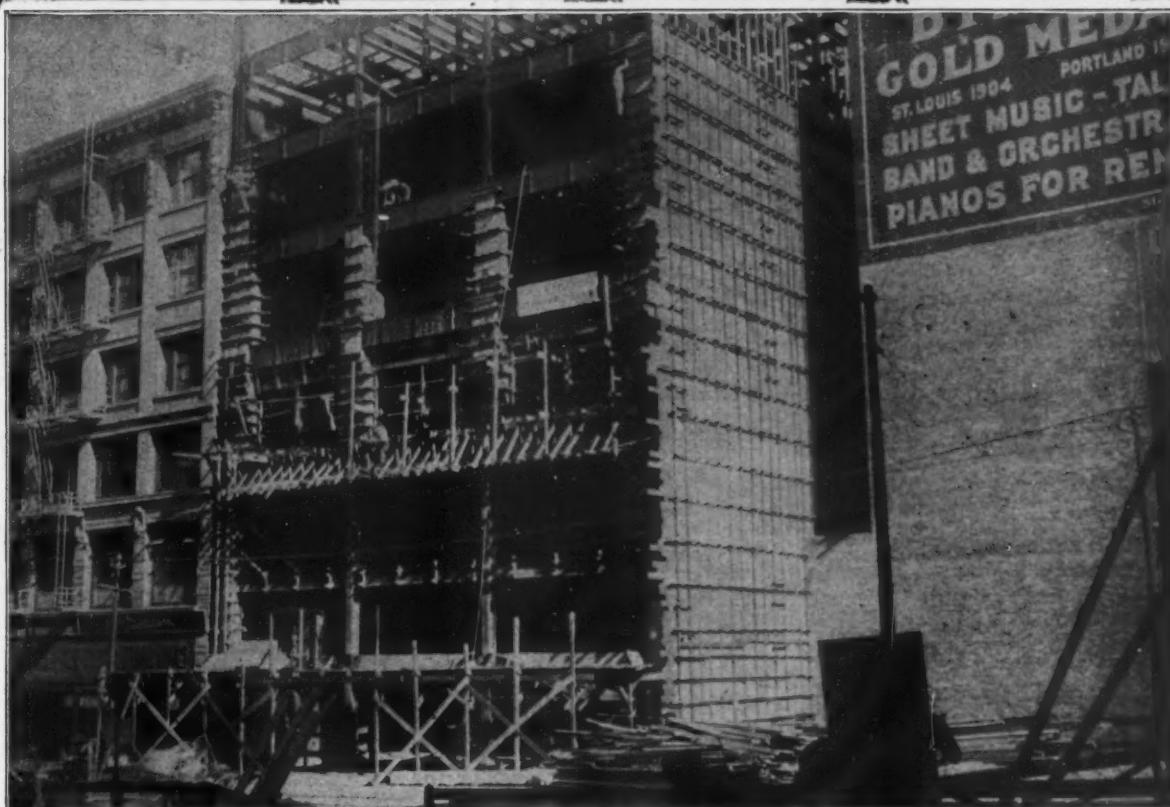
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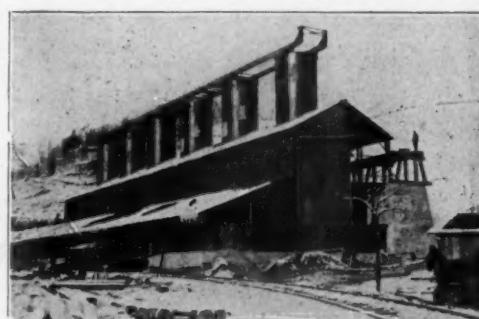
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Communications on subjects of interest to any branch of the stone industry are solicited and will be paid for if available.
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Editorial and advertising copy should reach this office at least five days preceding publication date.

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Entered as second-class matter July 2, 1907, at the Postoffice at Chicago, Illinois, under Act of March 3, 1879.

There are still two more conventions in the concrete industry to be held—the Iowa Association of Cement Users, at Cedar Rapids, March 9-11, and the Canadian Cement Show, which will be held at London, Ont., March 29 up to and including April 1.

Whether a man reclaims sand from the bed of a stream or digs it from a pit, if he fails to put in modern equipment for handling this low priced commodity in great quantity he will not succeed. The source of sand supply is one-half, its equipment amounts to another half as a basis of calculation.

The widespread interest in the Cement Show was a subject of considerable discussion throughout the convention week. There were men here from Africa, Australia, South America, the West Indies and large delegations from all parts of Canada who not only attended the Cement Show and the various conventions, but who purchased large quantities of machinery, equipment and material.

The tremendous interest taken by the public in general in the subject of cement and its various uses augurs well for the future of the concrete industry. The public is aroused as never before. It is asking questions and these questions are being satisfactorily answered by the erection of buildings of every form and description, of sidewalks and streets, bridges and culverts, dams and piers. In fact, there seems to be no end to the multitudinous uses in which this most plastic and pliable of all building materials may be utilized.

The rock crusher operators realize that a classification and standardizing of their product upon some basis of universal application to their industry has become essential to further development. The different sizes and conditions in which crushed rock is prepared for the consumer is very perplexing to the crusher man who has to produce the goods, as well as the engineer and contractor, who have to apply it to practical uses. The business of rock crushing has grown to the point where standard specifications upon an intelligent basis are imperative, as the growing importance of concrete aggregate and road material is constantly causing expensive misunderstandings as to the exact definition of the material ordered at the one end and expected for delivery at the other end. Progressive steps in this direction have already been started and we will be glad to receive the suggestions of more crusher operators with regard to bringing this very important matter to early completion. One can easily see the advantages of having specifications drawn that fit the requirements exactly so that a man can know just what he is bidding upon.

There is a question as to whether it would be advisable to hold two conventions, one at New York and one at Chicago, next year. New York is undoubtedly ripe for a convention, and Madison Square Garden would be an ideal location for such a vast show. The East, while it has accepted concrete in a sense, has been more conservative and it behooves the cement manufacturers and the manufacturers of machinery as well as those who have the general welfare of the industry at heart to join in the movement to have a show in New York even at the expense of not having one in Chicago. The Coliseum at Chicago has proved inadequate, as many exhibitors were prevented from gaining entrance to the floor through lack of accommodations. Chicago should erect an exhibition hall of such magnitude that exhibitions like the Cement Show, the Automobile Show, the Electrical Show and others of similar character could find accommodation not only for the display of their wares but also for their meetings.

The eleventh annual convention of the National Builders' Supply Association is a thing of the past. The attendance was by far the largest ever recorded at a similar gathering and the men who assembled here in convention were those who practically sell the great majority of the builders' supplies used in the United States. They are wide-awake, up-to-date business men employing methods in the handling of supplies which put them in a class with the greatest merchants in other lines. Not only were the meetings fraught with the keenest interest but the results accomplished were far greater than in any previous convention. The meetings were more harmonious. There was a greater feeling of brotherhood brought about by the fact that these men have come to know one another and to understand one another through long association, and are now accomplishing results which seemed chimerical at the outset but which now, since they have become accomplished facts, show the great value of association effort.

ROCK PRODUCTS is devoted to the development and introduction in the markets of all that is practical, economical and beneficial to users of concrete, whether it be the building of a home, the laying of a sidewalk, or any other kind of proper application of cement or cement products. An Information Bureau is maintained for the free use of subscribers for the purpose of furnishing the most reliable advice and instruction in reply to inquiries sent to this office. Like everything else that has great fundamental merit, the concrete industry is burdened with a small army of parasites who seek to profit by impositions on the public. To guard against the wiles of these parasites those who wish information should write to ROCK PRODUCTS. Nothing but what is good, safe and worthy is indorsed and recommended; and both the man who knows how to put in good concrete work and the people who can furnish materials and equipment can be found for the asking. ROCK PRODUCTS for a whole year only costs a dollar.

Every reader of this issue of ROCK PRODUCTS would do well to study carefully the reports of the various conventions. We have endeavored to cover them with our usual thoroughness, but owing to lack of space we have been compelled to omit discussions and eliminate some of the papers which were read. But still there is a vast amount of information which, if carefully read and digested, cannot fail to make a deep impression. The concrete industry is growing in leaps and bounds. It has enlisted the thought of some of the greatest minds in the industry, and the results are more than gratifying. We are no longer groping in the darkness. We have emerged from the chrysalis state as it were, and the industry frequently spoken of as being in its infancy can now be truthfully said to have grown to such proportions that it is no longer an infant. Concrete construction has come to stay, and when the appalling figures issued by the government showing the tremendous fire losses and the cost of maintaining fire-fighting appliances, as well as that of insurance, are taken into consideration, the greater becomes the need of fireproof construction. No one today can challenge the statement that concrete is at once the solution and the salvation of the problem.

EDITORIAL CHAT

Owing to the press of the many conventions being held in Chicago and the tremendous interests centering therein right at the time of our regular date of publication, ROCK PRODUCTS has been withheld for two or three days in order for history to be created, and in order to hand the same to our subscribers right off the bat.

Robert T. Creighton, general manager of the Foster-Creighton-Gould Co., quarry owners, stone contractors and crusher operators, in fact one of the largest industries in Nashville, Tenn., has been elected president of the Nashville Builders' Exchange.

The Steacy-Schmidt Manufacturing Company, York, Pa., announce that it has succeeded to the firm of Broome, Schmidt & Steacy Company, and that it will be continued along the same lines as heretofore, which includes the building of modern lime kilns that have made good.

Harry F. Rauch, who has a very wide acquaintance in Ohio and the middle west generally as a cement salesman, carries the banner of the Superior brand from the headquarters of that company at Cincinnati. Harry is personally acquainted with practically every cement buyer in the state of Ohio, and even knows the names of the horses that haul the cement to the job in most of the towns in his territory.

Geo. S. Bartlett, the celebrated fun-maker of the Portland cement industry, but always "with his eye on his number," has recently become sales manager of the Marquette Portland Cement Company, in addition to his other connection in the industry as vice-president of the Western Portland Cement Company, and vice-president of the Milwaukee Cement Company.

F. H. Perry, general manager of the Rapid City Lime and Gypsum Company, Rapid City, S. D., was a recent Chicago visitor. This concern is extensive

handlers of building materials of all kinds and manufacture lime and gypsum products. They contemplate a number of improvements. Their business has shown a steady and healthy growth during the past season, as their section of the country is developing very rapidly.

A. Baumberger, so well and favorably known in the cement industry, especially in the territory tributary to the great Kansas market, has become the sales manager for the Lumbermen's Portland Cement Company, with headquarters at Kansas City, where he will introduce a new brand of cement which is to be known as the Black Cat. This recognition of Hoo-Hoo, of which the Black Cat is the emblem, will make the brand a popular one right off the jump. Baum's policy, as well as that of the cat, are sure to make a record.

Great activity prevails throughout the state of Ohio in the making of extensive preparations for increased business the coming season. It is reported by the Williams Contractors' Supply Co., of Columbus, that it has this month closed more large deals than in any one month for many years. Among these deals are orders for five large Austin crushers with complete outfits for rock crushing plants in and near Columbus. The Austin crusher in the selling territory of the Williams Contractors' Supply Co., comprising Ohio, Pennsylvania and West Virginia, is said to be very popular and the energy and push of this firm has had much to do with the large number of these crushers installed within a year in these states.

W. P. Gilman, of the Wiebe Engineering Company, of New York City, was a recent caller at the Rock PRODUCTS sanctum. He is visiting the sand lime brick manufacturing plants, introducing their new line of machinery. The specialties are a sand drier and a hydrating machine, which hydrates the lime used in making sand lime brick in conjunction with a part of the sand after it has been dried and finely ground. His company has recently bought a large sand lime brick plant in the neighborhood of New York City, which they are rebuilding and equipping with their improved machinery. The lime proportion in every sand lime brick business has always been the vulnerable feature, and this machine is one of the first good things to be developed in this particular section of the process.

Classify Cement Show Exhibits.

Exhibits in the annex at the Cement Show, consisting almost exclusively of mixers, tampers, and similar machines, form a most attractive and popular feature of the big exhibition. The placing of this part of the show in the annex has served a double purpose of usefulness. Prospective buyers and others interested in this particular line of machinery find it in compact array, and may inspect it at leisure without chasing all over the main floor. Besides this it relieves the general public which is not directly interested in machinery, but does enjoy the exhibit of concrete products, from the awful roar and deafening noise which in previous exhibitions was most decidedly objectionable to this class.

This suggests the idea of a further movement in the line of improvement. Every year it becomes more evident that the Cement Show has become something more than a mere gathering place for makers and buyers of concrete-making machinery. In fact these people, while important and even vitally necessary to the success of the exhibition, no longer constitute a majority of the attendance. This is supplied by the great general public. Now this public is mainly interested in concrete products, not in the machinery with which they are produced. This latter is attractive, of course, and nearly everybody inspects it, but not until after they have seen what the machinery makes. The man who keeps his ears open will hear a hundred inquiries for the location of product exhibits to one for that of the producing machinery. Visitors who are not directly concerned in the industry want to see the things which they may use in the building of their residences or business places, or improvement of their farms or country homes. They wish to make comparison of the various kinds of building blocks, porch steps, fence posts, window caps, wall coping, cistern covers, and the hundred and odd other things which some day they may have occasion to buy. It is the money of these people that makes it possible to enlarge and expand the concrete industry to the benefit of all connected with it.

It would evidently be a good business proposition at future shows to devote the entire main floor of the Coliseum exclusively to exhibits of actual concrete productions of a useful and practical nature. Leaving out of question the matter of convenience to the great general public already referred to, the tremendous growth of the show will soon make something of this kind absolutely necessary. At the present rate of increase in exhibits and attendance these annual shows will at no distant date become as big as a full-fledged World's Fair. The necessity for a more thorough classification of the exhibits is already apparent. This must come, and in making it the men in charge will build well if they keep in mind the important fact that there are two distinct classes of people who attend these shows, both important, and both having objects and purposes which should be well provided for.

One class, the makers and buyers and users of machinery and concrete making ingredients, are chiefly interested in the methods and machines by which the results they seek may be the best and most economically produced. This is a class large and important enough to warrant the establishment of a classified machinery department.

Then we have the general public, the people who don't care a rap how concrete is produced, but are vitally interested in the things made from concrete. This public wants to see the actual articles, not pictures of them. This desire has already made this particular part of the Cement Show a most important feature. It may be still further advanced in practical value and interest by classifying all exhibits of this kind in one department. If this is done it will be a case of "see it grow."

Correction.

Victor Beutner, a prominent Pittsburgh engineer, who built the Altoona Portland Cement Co.'s plant, is building the Lumbermen's plant at Carlyle, Kan. They are putting in thirty-two Maxecon mills, using them both on the raw side and the clinker.

As an evidence of the rapid manner in which that dusty young metropolis of the West is growing into a city it is interesting to note that bids have been invited for laying 262,215 square yards of sheet asphalt pavement in Oklahoma City. The cost, as estimated by the city engineer, will be about \$860,000. This is a most remarkable public improvement to be made in a city which a few years ago was nothing but raw prairie. The bids, by the way, will close on March 7 at 5 p. m.

Col. William A. Raupp, of Pierce City, the well known manufacturer of Pierce City White Lime, and E. L. Roll, the prominent builders' supply man of Kansas City, attended the Chicago convention.



PAULY, THE MAGICIAN OF CONCRETE TILE, WAS THE MAIN FEATURE OF THE CHICAGO CEMENT SHOW.

ATTRACTIVE ECONOMY.

Concrete Structural Tile as Applied to Hotel and Office Construction.

The production during the past eighteen months of a concrete structural tile which can withstand the most rigid fire tests is bound in the future to play a very great part in the construction of large buildings such as hotels and offices.

The objections to concrete tiles for partition and floor work in the past have been: firstly, their inability to withstand the fire test; secondly, their excessive weight; and, thirdly and chiefly, the impossibility to manufacture them at prices to compete with other products.

The tiles which are now manufactured at New York, Youngstown, O., San Francisco, and several other places, by means of the process and with the machine which A. A. Pauley, of the Concrete, Stone & Sand Company, has evolved, have entirely overcome these objections and have already established a firm reputation.

To anyone who examines these tiles and their process of manufacture, the causes contributing to their reputation and growing popularity are apparent, and one is not surprised to hear that every factory reports that it is unable to cope with even local demands. The fire-resisting properties of these tiles have been demonstrated several times by very stringent tests. In one test a floor 12'x16' was built as follows: At each corner a pier two feet square, rising four feet above the ground, was built of these tiles. Resting on these piers were two reinforced concrete beams, 8"x16"x16' long. At right angles to and resting on top of these beams were placed reinforced concrete joists 4"x8"x12'. Between these joists were placed 6"x12"x12" concrete tiles. These joists were built up by first placing the tiles in position on forms and then pouring between the rows of tiles the concrete used in the formation of the joists. The bottom surface of the tiles and joists were therefore in one plane. The tiles being only 6" in depth and the beams 8", it was necessary to fill in over the tiles with 2" of concrete to surface up the top. This floor was loaded with 200 pounds per square foot thirty days after completion, and a fire was built under the structure. The fire was maintained for 2½ hours and pyrometric cones placed as near the fire zone as possible recorded a heat of over 1,800° F. The fire was then quenched with water at 20 pounds per square inch pressure—applied directly to the surface of the tiles. When the structure had been cooled by the application of this water it was found that the tiles were practically undamaged. After this test the fire resisting properties of the tiles cannot be disputed.

The objection as to the weight of the tiles has also been overcome and it is possible to produce a very much stronger tile of less weight than any similar product.

Now let us consider the additional qualifications which these tiles possess, adapting them to use in partition and floor construction, and the financial results of their use in a large building.

Their first qualification is that the tiles are mathematically correct in form—that is to say, each surface is plane—each surface is at right angles to the surface on either side and also the measurements of the cross section of these tiles do not vary 1-64" from the catalogued dimensions. This qualification makes it possible to build a 4" partition wall with each surface absolutely true. Therefore it is not necessary in plastering the wall to first of all procure by means of the first coat an even surface on which to apply the second and finishing coats. The second qualification is that the material and process by which the tiles are produced is such that the plaster or even a directly applied white lime putty coat, combines with the tile chemically and the combination is so complete that it is unnecessary to rely on any adhesion or mechanical bond to insure the plastering being sound.

These two qualifications taken in conjunction make it possible and practical to reduce the thickness of the plastering from $\frac{3}{4}$ " to $\frac{1}{4}$ ". In addition to this the concrete tile wall is monolithic from top to bottom and from surface to surface, so that a thinner, lighter, cheaper and better partition wall is produced.

The third qualification is the fact that the tiles are practically non-absorbent. In plastering any other type of wall the first thing the plasterer does is to damp the surface in order to prevent the sucking of all the moisture out of the plaster and in consequence not allowing the plaster to set up properly. Even when this preliminary wetting is resorted to all other wall materials suck a considerable amount of water out of the plaster, and consequently that part of the plaster in contact with the wall rarely sets up properly. In fact a thin layer of inert material is deposited

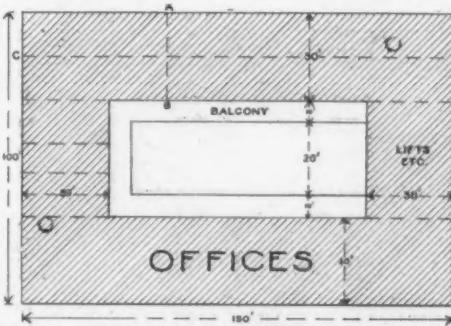
upon the porous base and it is necessary to rely entirely on the mechanical bond formed by ribs designed to hold the plaster. Now with a low absorbent tile the plaster sets naturally and at all times holds a sufficiency of moisture to produce its maximum strength in setting.

In floor construction these tiles can be used by building up the floor in a similar manner to that employed in constructing the floor for the fire test described above. A floor built in this way would be equally as good, very much lighter and cheaper than any other form of fireproof construction. Furthermore the qualifications of these tiles mentioned above make it again possible to reduce the ceiling plastering thickness on the under side of the floor tiles. These two reductions in weight produce a very much lighter floor.

In both partition and floor construction these claims have already been substantiated in buildings in which these tiles have been used.

Now let us consider the financial aspect of the proposition, and for example take an office or hotel building 150'x100' of eighteen stories, as shown in the sketch.

In dividing up the office space in the above building the partitions of any other material than concrete tile, the minimum thickness of each partition would measure $5\frac{1}{2}$ ". Now, by using 4" concrete tiles and $\frac{1}{4}$ " plastering on either side, as explained above, the thickness of each partition is reduced to $4\frac{1}{2}$ "—thereby providing an additional rentable area of office space. Calculating on dividing the office space into rooms 10' 4"x15' 0", there would be required thirty partition walls such as A B (13 each side and 4 at the left end). There would also be two partition walls running the whole length of the building, such as



C D. The additional rentable space of floor on each story would therefore be:

$$\begin{aligned} 30' \times 30' 0" \times 1" &= 75 \text{ square feet.} \\ 2' \times 150' 0" \times 1" &= 25 \text{ square feet.} \end{aligned}$$

$$100 \text{ square feet.}$$

$$\text{Total } 18' \times 100' = 1,800 \text{ square feet.}$$

The additional income derived would therefore be: 1,800 square feet at \$2.50 per square foot per annum=\$4,500.

Now the ceiling plastering would amount to over 12,000 square feet on each floor. Total for eighteen floors, 24,000 square yards.

The plastering of the partition walls on each floor would amount to about 40,000 square feet, or a total of 80,000 square yards. We therefore have 104,000 square yards of plastering. Taking this at 40 cents per square yard, the cost would be \$41,600. Now the saving in cost of plastering with the concrete tiles has been demonstrated to be 25 per cent. Therefore 25 per cent of \$41,600 equals \$10,400, represents the saving which will result from the use of these tiles.

Now the 4" partition tiles are $3\frac{1}{2}$ pounds per square foot lighter than a similar tile of other material; also reduces the plastering thickness from $\frac{3}{4}$ " to $\frac{1}{4}$ ". Therefore, on a 4" partition this results in a saving of 13 pounds per square foot of wall.

There are 20,000 square feet of partition walls on each floor. Therefore the reduction of weight to be carried by each set of floor girders is $20,000 \times 13$ pounds=260,000 pounds.

There is also the reduction in the weight of the floors owing to the use of hollow tiles and the reduction in ceiling thickness.

These reductions in weight would allow the steel girders to be reduced in strength and consequently in weight, and the total reduction would amount to 500,000 pounds for each floor, or a total of 9,000,000 pounds in the building. The great reduction would allow all the columns supporting the girders to be reduced in strength and weight. It can therefore be readily seen that the saving in cost of steelwork would be considerable, although it would be difficult to estimate the amount without more detailed treat-

ment than this article aims at. However it is safe to allow for the saving of the sum of \$10,000.

Another substantial economy will arise from the fact that a man working with true, even surfaced tiles such as these, will build a greater area of wall in a day, and also in doing so will use about one-half of the mortar used at present in the construction of any other known partition material. Allow for this a saving of \$5,000.

To sum up the economies in construction we have:

Plastering	\$10,400.00
Steelwork	10,000.00
Labor cost	5,000.00

Total reduction \$25,400.00

In addition to this we have an additional income of \$4,500 per annum, and adding the interest at the rate of 6 per cent on the reduction in capital expenditure of \$25,400, we have an increased income of \$6,024.

These observations indicate that all that has been claimed for concrete structural tile by those who are now introducing the material in the markets can be sustained by the facts developed in practice. As a matter of fact, the increasing number of users of these tiles cheerfully give them a pronounced preference, and are often willing to pay more for them than for other material.

With the opening of the coming building season a number of additional factories to supply concrete structural tiles will go into operation, including in the list Chicago, Detroit, Montreal, Atlanta and several other important markets.

F. H. Angell, the pulverizing expert of the Jeffrey Manufacturing Company, Columbus, Ohio, who has been an interested visitor at the show, left last night to resume business. Mr. Angell is one of the well known men in the profession, and it was with great regret that his many friends bade him good bye.

The Universal Crusher Company, of Cedar Rapids, Ia., has been organized to manufacture the Universal crusher, operated under the United States patent rights of the Veltor system. The officers of this company are: F. F. Dawley, president; E. A. Velde, vice president; D. B. Getty, secretary, and Jos. Cockfield, treasurer. The Universal crusher is well known as there are hundreds in operation. It is especially adapted to crush rock from $1\frac{1}{2}$ " to any smaller size. A six horsepower motor operates it and it has been found to be a machine that any contractor can well afford to investigate.

There is just one principle of insurance engineering in which all cement users and all concrete men in every capacity should pin in their bonnets and advocate without turning away from the plow. We recommend non-burning construction in all types of buildings, because such buildings are now possible everywhere by the application of concrete in one form or another, and this will positively eliminate fully 95 per cent of the fire danger involving loss of property and human life. To overcome the remaining 5 per cent will cost hundreds of millions and is at present out of reach for that reason, but the concrete industry is prepared now and for all future time to positively eliminate 95 per cent of the present fire risk.

The quarry wagon which was designed and is built by the Statler Stone Co., of Piqua, O., has been found in practice to be one of the economical items of equipment which the quarryman who uses them is sure to discover, and is just the thing for handling stone from the quarry face to the elevator. In very many quarries where a wide level floor is worked this beats railroad tracks and more expensive equipment, because the wagons can pass around one another without interference, while on the tracks the cars have to go in rotation in which they happen to be on the track. It is a little point in economy which is worth thinking about. The Statler equipment has been developed in practical work and the quarries that are using it are those who speak highest of its praises.

If James Mackie, the general manager of the National Water Proof Co., seems more genial than usual perhaps it's because of the extra "feather in his cap," due to the fact that "Te Pe Co" is being used for damp-proofing the interior walls of the halls and 540 rooms in the new Blackstone, Chicago's handsomest hotel. R. Hasselgren & Co., the decorators, are taking every precaution to give permanency to the artistic beauty of their work and have adopted "Te Pe Co" as the compound for preventing the exudence of saltwater or any possible moisture from staining or disfiguring the plastered walls. Mr. Mackie or some of his lieutenants at booth No. 14 are always pleased to explain the advantages of "Te Pe Co" to interested visitors at the show.

National Builders' Supply Association.

**Eleventh Annual Convention Is Well Attended, and Productive of Much Good to the Industry—
Some of the Interesting and Important Features of the Meeting.**

The eleventh annual convention of the National Builders' Supply Association will go down into history as a great event of the builders' supply business in this country. The attendance was large, interest keen and the results accomplished are all that the membership could desire. On account of the fact that low rates were made on practically all of the railroads leading into Chicago, and the further fact that the Cement Show was in progress at the Coliseum, the builders' supply dealers and manufacturers from every quarter were on hand.

The program fairly bristled with good things, and all that was lacking was more aggressiveness on the floor. The trend of the meetings showed that the industry is going upward and onward.

Too much credit cannot be given to the officers of the association, who have labored long and faithfully to bring about the results which have been achieved.

The formal opening of the convention was scheduled for 10 o'clock Wednesday, February 23. President Frank S. Wright broke down under the strain of the preliminary work and was forced to retire from the chair.

OPENING SESSION FEBRUARY 23.

Gordon Willis, former president of the association, took the chair and carried on the convention. Mr. Willis explained Mr. Wright's condition and then went on with the meeting. Health Commissioner Evans, of Chicago, was present on behalf of the city and made a welcoming address. Mr. Willis, on behalf of the association, spoke in his usual happy manner. The roll call was dispensed with and Secretary James W. Wardrop reported a large list of applicants for membership. At the conclusion of his speech regarding his efforts in this direction all were unanimously elected.

The minutes of the executive meetings which have been held since the adjournment of the last convention were read and after a brief discussion approved. This put the members in close touch with all the work which had been done up to the present time, giving the members an intelligent basis for carrying on the work in hand.

The annual report of the secretary was next read, and it was a rousing document bristling with suggestions for the future as well as the doings of the past year of the association. In this Mr. Wardrop did himself proud and showed that he had been on the job every minute of his time and that there was no doubt that the work accomplished would have made a greater record if the men who make up the rank and file of the association had done their part to support the progressive work of the officers of the executive committee as expressed through the labors of the secretary's office.

At the close of the secretary's report there was a hearty round of applause and there was not a word of criticism, although many of the members were surprised to learn of the remarkable activity of the organization in which they themselves had taken but small part and thereby overlooked one of those opportunities which may never return.

The chairman appointed a nominating committee consisting of Messrs. D. J. Kennedy, M. A. Reeb, W. C. Schultz, J. D. Eichelberger and H. A. Moore. They were instructed to make a list and selection for the officers of the association for the coming year and to submit the same at the business meeting on Thursday.

A committee on resolutions was appointed consisting of Luther Keller, Charles Weiler and James W. Wardrop. This committee was instructed to be ready to report at the business meeting on Thursday.

On motion it was decided to send the highly esteemed president a bunch of rare flowers, emblematic of the sentiments of the association in convention assembled, and as a token of the regard of each one present in his disability.

The meeting then adjourned for luncheon.

AFTERNOON SESSION FEBRUARY 23.

Chairman Willis called the meeting to order promptly at 3 o'clock, and the members practically filled the Florentine room of the Annex, where all the meetings of the convention are being held. The entire session was taken up with four papers and brief discussions, as follows:

WHAT SHOULD THE RELATIONS BE BETWEEN THE MANUFACTURER AND THE DEALER.

By J. MAXWELL CAREER,

Secretary and General Manager Blanc Stainless Cement Co., Allentown, Pa.

This is the subject matter assigned to me by your secretary—may I say, our secretary? Is the subject worth the solution? Is the solution possible? I think so.

The last speaker on this subject two years ago at a banquet of this association in Chicago, the president of a new subsidiary of a colossal corporation, after weaving threads of steel through your dreams and expectations, ended with the statement, "I give it up," and then proceeded to tell us a good story, at least I judged it such, for you all laughed heartily at it. I propose to take up the subject where he gave it up, for a man holding his position, with the enormous interests involved, was evidently laboring under some misunderstanding or confusion or he would not have frankly acknowledged that the problem was beyond his solution.

Let us then dwell on this confusion and clear it together. Mr. Dealer, what do you understand by distributor, a wholesaler, a legitimate dealer, a local dealer, etc.? Are you quite sure that you mean the same thing in Chicago as they do in New York, as we do in Allentown, or the other fellow does in Arizona? The very thing they give you is the cause of your first confusion.

When the rotary process of making Portland cement was perfected and the present industry was made possible there was no such trouble or confusion. The foreign cements were handled in this country by banking or com-

The local dealer meanwhile was growing apace, and with the advent of additional mills, with lower freight rates fighting for an existence, the situation became critical. And briefly stating the facts, the wholesaler's territory was restricted by the manufacturer, the local dealer was granted additional privileges—and again the new manufacturer sought his salvation with the consumer.

This led to abuses on both sides, to the curtailing of the field of operation of the manufacturer as well as the wholesaler, to the strengthening of the local dealer, and finally, to several manufacturers establishing their own offices and selling direct to all comers.

This practical description of the origin of the three classes should clear the confusion and bring us to the date of the banquet. We had then, as we have now, the wholesaler and the dealer.

The wholesaler, usually a manufacturer himself of lime, natural cement, plaster, terra cotta or other building materials, usually of large financial standing, having a force of men engaged in the distribution of his own product, feels he can dispose of other products with economy.

Is he of any use to the manufacturer, or will he ultimately disappear? I say he is indispensable, his financial standing, his facilities, his trade connections will always make the wholesaler an indispensable agent of the manufacturer, especially the one located away from his own territory, provided the wholesaler understands his functions as an agent and works in harmony with the manufacturer, and having already absorbed or eliminated the distributor does not attempt to absorb the dealer too, and rising above local prejudices, if he be a dealer in his own local market (according to my definition) treat the other dealers located in that city squarely and establish selling methods that will not conflict with the legitimate interests of these dealers.

The dealer is the man with one or more yards who sells direct to the consumer at the building in such quantities as he may from time to time require.

Is he of any use to the manufacturer, or will he ultimately disappear? I say that the dealer is even more indispensable to the manufacturer than the wholesaler, for his influence and facilities can be used by the manufacturer not only far away, but right at home. He is the indispensable conveyor of the manufacturers' goods, provided he understands his functions as a dealer and delivers what the consumer asks him for, and stops bucking the manufacturer and trying to be a wholesaler.

No one objects to a dealer's enlarging the scope of his work and becoming a wholesaler if he has the facilities, or even a manufacturer if he has the financial backing, but the constant bickering of the dealer, the wholesaler and the manufacturer has caused the present chaos and given rise to the claim that the wholesaler wishes to keep the dealer out of touch with the manufacturer, that the dealer is not wanted in this association, as the leading spirits of the organization are wholesalers. Who elected them to office? We manufacturers, as associate members have no vote.

It is true that some of the manufacturers are backing this contention, but you don't want to believe everything you hear, whether you be a manufacturer or dealer. You dealers elected these men yourselves, I suppose, because they were big men. It takes big men to do big things. All great achievements have been the gradual development of a great thought, usually preceded by criticism, opposition, wrangling, fighting and often accompanied with bloodshed before its ultimate adoption by the world at large.

This National Association, I believe, is bending every effort to bring the dealers together. You know the work our secretary has been doing for the past year to get the local dealers together, to get them here.

As I understand it, your vice presidents are wholly responsible to you and to us for the success of this association. Are they spreading your message in your state? Are they doing all in their power to make the dealer understand the value of the great good you are trying to accomplish? Have they brought the dealer to this convention? And if not, why?

The dealers control the situation, as they outnumber the wholesalers, therefore it is my idea that if conditions are not satisfactory, the dealer and the manufacturer are to blame.

The dealer as I have described him in his past and present struggle with the manufacturer claims he should have a fair margin of profit over and above his fixed charges and expenses, not forgetting the depreciation of merchandise as well as the long deferred payments.

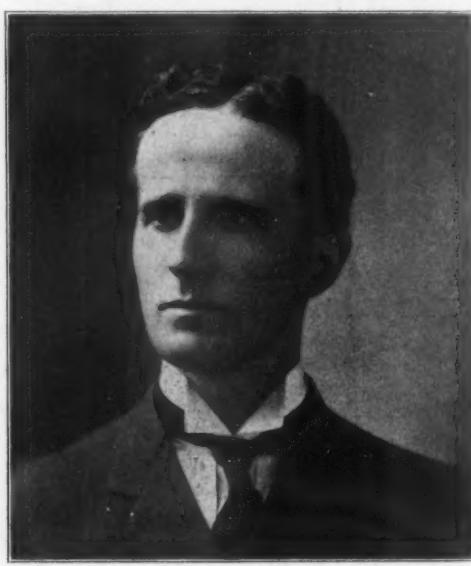
My answer to this argument is that this is not a question of sentiment or feeling; it is strictly busi-

I grant the manufacturer has often been at fault, especially when he persists in dictating to the dealer by joint resolution this or that profit, no matter where located, no matter what the competition is with total disregard of commercial conditions and his own individual advantage, but I do not see why the manufacturer should be called upon to favor an individual dealer in the locality and be requested to discriminate against the other dealers in that town unless he gets a compensating return for such a contract.

The manufacturer knows from statistics that excepting in a few places no individual dealer sells over 20% of the local demand. Why should he be asked to discriminate against the other 80%? The manufacturer knows that the dealer does not depend on one brand of cement to earn his living. He knows that one dealer can sell for less than another, that one body of dealers in one locality can deliver for less than another body of dealers in another locality, just as one manufacturer can produce for less than another, that one set of manufacturers can deliver at a less cost than another set located farther away.

Remove your preconceived idea that the manufacturer is fighting the dealer. The manufacturer has rights and not only privileges. The manufacturer is not fighting the dealer; he is fighting for existence; and I say that the dealer is indispensable to him in that fight.

The manufacturer has invested his fortune, too, and that of others to produce an article he considers of



CHARLES WARNER, WILMINGTON, DEL., EXECUTIVE COMMITTEE N. B. S. A.

ROCK PRODUCTS

merit, and under ordinary conditions the success of his enterprise depends on the marketing of his goods at a fair profit, and he has got to make good or get out of business.

The dealer often calls upon the manufacturer for the exclusive agency of his brand without any guarantee of sale, prescribes the same rules for a new manufacturer as for an old established one. Why?

He prescribes in one place that a manufacturer can sell a railroad or this or that amount of cement to a consumer, and in another place that he can sell nothing. Why? He threatens boycotts in one part of the country and reprisals in another. Why?

Why insist on exclusive agencies and thereby start your competitors looking for similar goods to fight you with? Why not sell your customer what he asks you for, and stop pushing the "just as good article"? Why bother about the "just as good article"?

Do you know whether it is as good? Anybody can cut prices; it takes brains to make a better article. We who have spent our lifetime in the cement business could fill volumes with what we don't know about cement. Why, then, dwell on the vague, offend personality and try to legislate decency?

It is the manufacturer's business to produce and ship his goods. It is the dealer's business to sell and deliver. The manufacturer must create the demand. It is your business to sell the consumer: just sell.

It is my conception that the mill, the warehouse, the yard and the consumer can be mutual friends if they only adopt that great element of success—"teamwork". And in the game of life give up trying to see who can kick the farthest.

Let us grasp our opportunity, and rushing it as one man to the goal of our ambition, try to play fair and clean that the game may be finished before dark, and the score will be 4-0, representing the consumer, dealer, wholesaler and manufacturer, an invincible team.

Get together, gentlemen, that is my first recommendation. I have given you a brief sketch of the relations of the manufacturer and the dealer at large for the past decade or more. The general difficulties, the individual pitfalls that we may encounter must be handled by us as individuals as they confront us. I have brought you up to this very minute and recommend to you the first step in the solution of the problem assigned to me: Get together on sane, sound business relations, and I know of no better way of accomplishing this than by lending a hand to the good work this association is doing.

For my final solution of the problem I will take the second part of the last speaker's address at the banquet, his good story at which you all so heartily laughed. I can imagine no greater work than the bringing of this gentleman and his company back to the fold of this association, and if the clearing of the confusion of class distinctions and my recommendation will be accepted by you and by him, I can then show him the mischief his funny story meant, how easily it could have been avoided if we only would get together to play the game of life and to settle what position we shall each fill on the team, what rules we shall play under, and when and where we may play.

His funny story was of a man leaving some administration building, slipping on the stairs, and on his way down knocking a young woman off her feet and taking her down to the landing, where he informed her that this was as far as he was going. I wondered then what that story meant. Do you see it now?

Perhaps we don't see the same point. Let me show you what I see. The administration building naturally contains a buyer, the man slipping on the stairs a manufacturer who at the sight of the dealer coming up the stairs, in the disguise of a lady or the weaker sex, conveniently slips, knocks her off her feet, carries her to a place out of reach and tells her that that is as far as he is going with her. Gentlemen, I ask you has that been your experience for the past two years?

The argument of the manufacturer is self-evident. If the case were reversed and the man were the dealer he would have done the same thing to us, says the lady manufacturer. So there you are, and what are you going to do about it? And in what question I find my answer to you and the final solution of the problem.

Get together before you slip, gentlemen; have a square talk, a square understanding, then go up those stairs together and get the order together. That's my understanding of a square deal.

WHY SELLING THROUGH DEALERS ONLY IS THE MOST SUCCESSFUL METHOD OF MARKETING BUILDERS' MATERIALS.

By V. H. KRIEGSHABER.

Whenever the business relations existing between manufacturers and dealers continue mutually profitable you will generally find a satisfied producer and a loyal agent working together satisfactorily. Let either side take advantage of a passing opportunity to make a sale or deal of importance, and ignore or disregard the reasonable consideration which each should bear toward the other, right there you will find the beginning of the rupture that will ultimately produce more or less bad feeling between the two parties.

From the standpoint of a dealer, I naturally feel strongly on the subject and believe that all business originating in a particular city or district should go through the dealer living there, who has honesty and conscientiously represented the manufacturer. If the dealer is absolutely necessary to the manufacturer in the distribution of small orders of cement and plaster, he should be just as necessary when it comes to the distribution of carload business or orders running up into the thousands of barrels. If it is not always practicable or feasible to have such large orders go through the dealer, then he ought to be protected by an arbitrary of at least 10 cents a barrel as against the contractor or outside purchaser, so that at least the opportunity may be given him to meet the manufacturers' direct price to the consumer on large lot orders.

Has it ever occurred to you that the local dealer is the best advertising agent that the manufacturer can get, and for this alone, if for nothing else, he should be entitled to better protection than he is now getting?

An active dealer secures the specification of the manufacturers' product by the engineer or architect; he is constantly bringing its merits before the consumer; he carries the goods in his warehouse, distributes them as needed—he takes a larger commercial risk in the sale of the goods, and then when a big job comes along he has to step aside until the manufacturers get through cutting and slashing prices for the benefit of the big contractor, who understands so well how to work one against the

other, and as a result neither the manufacturer nor the dealer gets much out of the job. Oh, yes! the manufacturer gets the advertisement of having furnished his product on the biggest office building or factory, or hotel, or what not in the town; that is the sop that the contractor throws to him for his low price, and at the round-up no money has been made on such an order.

We have another grievance against some of the manufacturers, and it is that of giving a factory price per ton on plaster and lath or cement or sewer pipe to the contractor who bids on the larger work wherever it may come up. I have in mind a plaster contractor who came into a certain city to bid on a large job of plastering. The local dealers represented different brands of goods, and were offering them to the public at reasonable prices. This contractor went to a dealer offering a certain brand of plaster and told him, "Oh, I have a standing offer by the year from the factory making such goods, and can buy them per ton at a fixed price—I can put that brand into your city as cheap or cheaper than you can buy it from the same manufacturer."

This method of pandering to large plaster contractors has a tendency to hold down prices on plaster—it prevents local plasterers from taking larger orders, and effectively cuts out the dealer from making a good sale. The manufacturers make a very low standing price to the contractors of this class, and they are the only ones to be benefited.

Isn't it about time that we should get together and discourage such methods of business that mean a trade demoralization and result in price cutting wherever and whenever indulged in?

Is it not to the manufacturers' advantage to put the dealer in a position where he can sell his goods at a reasonable profit, and thereby pay his bills more promptly, and do we really not depend upon each other more than we are willing to admit?

It is a subject of vital importance to both sides—it should be discussed with a proper spirit of consideration for the rights of both parties, and I believe if we will do this that order will come where chaos exists—that harmony will succeed dissension, and a legitimate profit will result where we now often stare a loss in the face.



FRANK S. WRIGHT, EX-PRESIDENT OF THE NATIONAL BUILDERS' SUPPLY ASSOCIATION,
CHICAGO, ILL.

The future has promise of a reawakening of business prosperity—it is foolish to throw away our opportunities. I hope that this will not be done. The dealer should receive proper cooperation and protection at the hands of the manufacturer, and the manufacturer should be loyally represented by the dealer—that is the millennium for which we are striving, and which we hope will come very soon.

"Power Trucks—Their Development, and Value to Building Material Dealers," by Charles Warner, Wilmington, Del., was read by James C. Adams of Pittsburgh, Pa. This paper amounts to a continuance of this same subject which Mr. Warner opened at the Louisville convention one year ago, and is one of the best which the members of the association consider to be of great value to their operations. There is no question that the power trucks in a coming institution in the supply business and the successful experiments which have been carried out by the Warner company have been anticipated with the greatest of interest.

THE FUTURE.

By Charles Weller.

There is a terrible amount of truth back of the somber and gloomy indictment against humanity uttered by the ancient philosopher who said, "Everything that lives upon this earth must either fight, or run, or hide."

Before the dawn of civilization, when men were but little above the brute creation, this epigram was literally

true. It is even true today in the last few remaining localities of savagery in equatorial Africa and Australasia, and the primal instinct of these few poor creatures in the face of impending danger, is to fight if there is a good chance of success; to run if there is no chance; and to hide if incapable of either fight or flight; and if there is anything in life, or intelligence, or civilization, or mental growth, worth cultivating and preserving, it is the uplifting and never-ending progress of humanity toward better conditions, towards a higher life, a more serene environment, a growing appreciation of the essential Brotherhood of Man.

The past has been one long tragedy of fighting, running and hiding; its days, and years, and centuries, drenched with blood, and sweat, and tears; and only its slow and painful stumbling towards the light of the future relieves the hideousness of it all.

The present is the formative period, and the connecting link between savagery and civilization, between the domination of might and the rule of right; for the future rises golden with promise for all the children of men. We are leaving behind us as rapidly as our mental limitations will permit, the night of helpless struggle, and are facing the dawn of a new era and a nobler life.

The root of all our business troubles is competition, for competition is war, and war is hell! So long as we are tied down to unrestrained competition, just so long will we be tied down to the hideous necessity of fighting our brothers in the same trade for our business lives; whereas if we can learn to cooperate with each other, we may reap the rewards of our efforts in peace, and comfort, and brotherly good-will. The necessity for the change from the brutality of unrestricted competition, to the humane and enlightened policy of cooperation, has dawned upon us all, and is growing with the natural rapidity with which ascertained truth always overthrows superstitious error; yet there is a numerous class of men who are always anxious to drag on the brakes, and frantically trying to turn back the hands on the time-piece of progress. These men, when they get into politics, have the nerve to call themselves "progressives," when as a matter of fact, they are the most hopeless of reactionaries! Their eyes are set in the back of their heads, and they are always looking to the dismal past and trying to push us all back into chaotic blackness. They ignore facts which are, in themselves, indictments of their own mental capacity, and prove their inability to keep step with the progress of the age.

I remember when a boy, contemplating my hopes of a successful business future, running across a statement of the Bradstreet agency, that eight-five men out of a hundred, who engaged in mercantile pursuits, failed in business, and I know of no worse commentary upon man's intelligence than that disheartening prediction. This was at a time when competition held undisputed sway, and when modern cooperation was unknown, but today the spirit of cooperation is abroad in the land, and humanity has grown sick of this fearful sacrifice to the devils of the past, and is steadily marching away from light and darkness, into the glowing dawn, and nothing proves it better than the statement issued in 1908, that now, only forty-five men out of a hundred fail in business! Today, thank God! our sons have at least an even chance of success, where a generation ago they had practically no chance at all, and, while our business conditions are far from being ideal, we know that we have traveled farther along the right road in thirty years than we have traveled before in all the recorded years of time.

It is our plain duty to resolutely refuse to be led back into the wilderness by false guides, regardless of their fictitious temporary popularity, and to stand like a rock in defense of enlightened modern methods in business cooperation. The hope and promise of prosperity is the strongest impulse extant, to right life, and right conduct, and right citizenship; and prosperity can only be fostered by right cooperation, and he is an enemy to mankind who stands in front of the open door and points the way back into the jungle of savage, brutal, and inhuman competition.

One of the most amazingly short-sighted views of the modern "trust," carelessly held by many of us, and carefully cultivated by the self-seeking demagogue, is the puerile notion that the trust concentrates business profits in the hands of the few, and shuts the door of opportunity in the face of the coming race. That view ignores the plain truth that the same men who were once competitors, are still integral parts of the combination, and are making their living under new and better conditions just as much as when they were all so-called "independents"; and also that the transferability of ownership has become so easily subdivided that new owners flock into the trusts and become potential manufacturers, literally in swarms. That assertion needs no proof and is patent to all, but as an illustration, I know a man who is now a stockholder in the American Tobacco Company, who tells me that when the company was formed, it comprised some fifty individuals, many of whom were on the ragged edge through the years of hard fighting among themselves, while today, there are over three thousand stockholders, each of whom is an actual tobacco manufacturer. Under the old bad conditions, a man who had money enough to put up a tobacco factory would have entered upon a long, hard, losing fight, while today he can put the same money into stock of that business, with assured prospects of success. Talk about shutting the door of hope in the face of our sons, under such conditions, is either false or foolish! As a matter of fact, the field is vastly broader, wider, and more open to every proper participant in any trade.

I once knew a man who used to say with great emphasis, "Damn these monopolists! I wish I was one of them!" He no longer needs to even wish it, for he can become one any day! It all harks back to the natural query, shall we be reactionary obstructionists and quarrel with the resistless spirit of the age, or shall we not better join hands in the general uplift, and help ourselves to better conditions, by helping others to improve their conditions.

I refer, of course, especially to the Portland cement trade, notoriously as fiercely warring and competitive a business as can be found outside the jungles of equatorial Africa. I assert, and believe most of you will agree, that the disreputable low prices of 1909 have been an unmitigated curse to every dealer in the land who has one or more warring competitors. Every cut by the mill has been a signal for a deeper cut by the dealer, and the low and failing market has merely added ammunition to the armies of fighters on both sides. Can any one doubt that if the Portland trade were as well organized and handled as some other trades, it would be a blessing to us all, insuring us reliable prices, and equitable and ethical and sensible distribution.

While I look upon a united cement corporation as a future certainty, because it will be based upon the compelling need of progress, it is a question whether that trade will be one of the last to get in line with right methods, and while they are struggling with the great problem, I believe they are entitled to our moral sympathy, and, in every proper way, to our active support. Their problems and troubles are, to a large extent, our own, and as our prosperity, to an equally large extent, is linked with theirs, it is plainly to our interest to help them so far as we can, to stop the heavy drain upon their finances, which, in the last analysis, is wasted upon the calloused and unappreciative consumer. I use the word "wasted" advisedly, for even the ultimate consumer, as a class, and even the farmer, does not benefit, in the long run, from any manufacturers' ruinous fights, though it is an almost hopeless task to make the American farmer see anything with a broad and clear mental vision befogged as he always is, with yellow magazines and yellow politicians. We all know that there is no class of men on earth doing so well and comparatively so prosperous as that habitual and chronic knicker—the farmer—yet the more prosperous he grows, the higher and harder he kicks at the prosperity of others. One would naturally suppose that he could easily see that his own prosperity depended upon the buying power of his customers, and that he would be chary about killing the goose that laid the golden eggs. I am charitable enough to believe that even the farmer would see the truth of business problems in their sensible light, if left alone to work out his own mental processes, and the trouble back of him is the sinister, self-seeking, insincere, red-mouthed blatherskite of a political demagogue, after the farmer vote, and caring for nothing else.

None of us here present may live to see the day, but anyone with a mind open to logic and watchful of the trend of our everyday affairs, can realize that the time is coming, and may be much nearer at hand than we may believe, when every trade will be so organized and centralized that its reasonable and regulated profits may be known in advance, its assured prosperity open to every proper participant, and the day of brutal competition forever relegated to the list of horrors of the black and bloody past.

The future holds out to us the promise and potency of wise and regulated manufacture, and the even balance of rights between the producer and consumer, carrying with it the protection of everyone concerned, in his individual rights. Our own interests, as dealers and distributors of manufactured articles, have often been sacrificed to the spirit of greed which flourishes in the rotten soil of competition, and until a better and wiser day dawns upon the world, we are forced to defend our natural rights by just such organizations as this. In fact, these organizations, unknown a generation since, and now common to all trades, are living proofs of the awakening spirit of the brotherhood of man. We are beginning to realize that "In Union there is Strength." A child may break a thousand twigs, taken one at a time, but the most powerful giant cannot bend, or break, or injure them when firmly bound together. There is the lesson that we cannot learn too quickly for our own good. The lesson of solidarity, of the complete realization that our brothers' rights are our own, that an injustice to one is an injustice to all! If we would all act upon that ideal, our troubles would be greatly lessened and simplified, for the united influence of our trade at large would be an irresistible force, so long as we keep within our reasonable rights.

There is work to be done and duties devolving upon us all, if we are in earnest about the improvement of our mutual conditions. There should be, of course, a much larger membership in our association and our first thought and largest interest should be to induce every brother-dealer to join our dealers-brotherhood. If there are any obstacles in the way of more wide-spread membership, let us abolish the obstacles. If there are any proofs that we can give of the benefit of membership to a doubting applicant, let us produce the proofs in the evidence of good work and hearty support of the entire association in the defense of the imperiled rights of even its humblest member.

I am reluctant to speak of the obstacle to an increased membership involved in the present cost, for personally I am entirely satisfied that the advance made last winter was justified by the financial needs of the association, and had I been present at Louisville, I should doubtless have voted for the raise in dues from ten dollars to twenty-four dollars per annum. At the same time I think we are all in the feeling that if we could heavily increase the membership by reverting back to the ten-dollar rate, we would be glad to do so, or if we could double that increased membership by making a five-dollar rate, we would be glad to do that, or if we could take in every dealer in every reasonable market, by abolishing all charges and dues, we would be still more glad to do that, provided some other means could be devised to meet our modest annual expenses. I am not urging or recommending any of these rates, and am quite willing to be guided by the wise counsels of our leaders, but I may express the wish that in some way the right of membership in our association should be thrown wide open to every dealer in the land, as free of cost or obligation, as attendance at a church, where only a contribution such as a visitor feels like making, may be made toward necessary and modest expenditures. With a membership bounded only by the limits of our country, and inspired by a hearty and genuine feeling of solidarity, our association would be an impregnable fortress, in defense of dealers' rights.

A natural and constantly recurring question arises—are we doing all we can and should in defense of dealers' rights, and if we can do more, what form should our exertions take? I dislike to obtrude personalities in the discussion of this question, but I am reminded of the time that I served for three years upon your executive committee, and upon the occasion of their quarterly meetings to consider grievances and complaints, I was at first appalled at the large number of dealers' protests, under investigation and carried into voluminous correspondence. I honestly felt that our interests were being sacrificed by excessive fault-finding, and I remember at one of our conventions urging our members to be moderate in their complaints and to exhaust their own resources in harmonizing their difficulties before asking the association to take up their problems. I am frank to say to you that I have been troubled about this well-meant advice ever since, for before I had served out my three-year sentence, I noticed that complaints dwindled away until we might have supposed the millennium had arrived! Now, gentlemen, if I was ever the cause of discouraging a just complaint, or ever chloroformed an attempt to defend any dealer in his violated rights, I am genuinely sorry for it, and I hope that anyone here, or

any absent member, who has been wantonly injured by any manufacturer's policy, will make prompt complaint to our association, and I hope officers and members alike will stand by the complainant loyally and efficiently.

My idea of a proper handling of such a complaint would be something like this: The secretary and executive committee would investigate the complaint, satisfy themselves that the injury was unnecessary, and that the complainant was entirely in the right, and then after some preliminary correspondence with the mill looking to a commission settlement or otherwise, and finding it necessary to call upon the reserve moral force of the entire body, the secretary would address letters worded something like the following:

"To John Doe, Member National Builders' Supply Association, Smithville, South Carolina.

"Complaint has been made and substantiated by our fellow member, Mr. Richard Roe, of Bunker Hill, South Dakota, that the Gilt Edge Cement Co., entirely ignoring Mr. Roe's rights and interests in his home trade, has supplied their cement direct, and without compensation to Mr. Roe's customers.

"I find that you and forty-five other members handle the Gilt Edge Cement in your home market, doubtless to your entire mutual satisfaction, and I am sending, herewith, copies of this letter to each one of you, asking if you will at once write to the Gilt Edge Cement Co., expressing your personal wish that they would hereafter handle this trade in conformity with the right principles of a just regard for Dealer Rights, as being, in the long run, in harmony with the cement company's best interests. A copy of such letter as you may see fit to write, to be forwarded by me to Mr. Roe, showing him that he has your sympathy and moral support, will be appreciated by us all."

Now, gentlemen, if I should receive a letter like this, I would feel it my duty to at once write a letter of protest to any company supplying me anything, and on the other hand, if I was the complainant, I should feel greatly heartened and encouraged with the cumulative evidence of the earnest fight in my behalf made by the association, as a body, and by every member of it handling the same goods that I did. An instance of this



AMBROSE TOMPKINS, NEWARK, N. J., TOMPKINS BROTHERS.

kind would go a long ways toward convincing our members that the association is a tower of strength to them and an ever present help in time of trouble; for an avalanche of letters of protest to any mill would be received with thoughtful consideration.

It is along some such crude and general lines that we may hope to change the discouraged apathy some members may feel, into a new and a real enthusiasm for the cause represented by the National Builders' Supply Association, and for "The Future" towards which we are all headed.

With the approval of the convention the members took the evening for visiting the great cement show at the Coliseum.

CLOSE OF SUPPLY DEALERS' MEETING.

The program of the convention was resumed and two sessions were held on Thursday in which a number of papers were read and discussed.

WHAT'S THE MATTER WITH THE N. B. S. A?

By JACOB G. BROWN.

At the several conventions of this association which I have attended there has been considerable said as to the relation between manufacturer and dealer. The question, whatever it may be, is evidently no nearer an intelligent or satisfactory solution, if one is to judge by the papers read, the addresses delivered and such discussion as has been held on the subject.

When our president only yesterday, following the paper of Mr. Carrere, was endeavoring to secure someone to discuss the question from the dealer's standpoint, I was racking my brain to discover if possible just the par-

ticular grievance that the dealer had against the manufacturer, or more properly, against the cement manufacturer, who, it seems, if we are to judge by what has been said, is the chief malefactor. I am free to confess that I was unable to find any. With the same thought, however, came another. Are we members of the National Builders' Supply Association merely dealers in cement, or are we what we pretend to be, dealers in *builders' supplies* in the full meaning of the word—that is, cement, sand, gravel, stone, lime, sewer pipe, etc.

If the former is the case, then it is right and proper that the discussion of the question should occupy the major portion of our time and thought, and should be thoroughly discussed from every viewpoint looking to a solution that will be satisfactory to all parties concerned.

If, however, it is not true; if the dealer who attends this convention is something more than a mere cement dealer, and it seems to me that the reluctance with which any of them spoke yesterday and their evident unwillingness to enter into a discussion that was of no interest to them, is evidence that they are, *then I ask why threats*? Why fan the air in a vain attempt to solve a problem that does not exist for the average dealer in builders' supplies who, I believe, forms a majority of the members of our organization.

I have stated that it is my belief that the members of the National Builders' Supply Association are more than mere cement dealers; let us stop just a moment and investigate the basis of my belief. For the purposes of my argument, it is safe to assume that, with an occasional exception, conditions in most localities are similar; that where a contractor purchases cement he must of necessity purchase sand, gravel, stone and other supplies that are necessary where cement is used.

The figures which I am about to present are, of course, taken from my own experience in Detroit. In the year just ended the sales of my company, who handle supplies only as a summer line, amounted to approximately \$125,000, representing a gross earning of nearly \$45,000.

The sales itemized consisted of

Twenty-five thousand bbls. cement at \$1.20 per bbl. delivered.

Twenty thousand tons of stone at \$1.25 per ton delivered.

Fifteen thousand yards of gravel at \$1.50 per yard delivered.

Thirty-five thousand yards of sand at \$1 per yard delivered.

Also miscellaneous supplies to the extent of about \$15,000.

A survey of these figures develops the fact that our cement sales in dollars and cents represented about 24 per cent of the total, and the cement earnings about 11 per cent of the total earnings, on the basis of 20 cents margin per barrel.

These figures, if they prove anything, prove that in our case at least the profits on cement sales represent only one-tenth of our earnings and effort, and if what I said before as to conditions in most localities being similar is true, then my argument is established, and to what end?

To the end that I and my fellow supply members who attend this convention are interested only slightly in the troubles of the cement manufacturer, either with us as a body or with his fellow manufacturer. We are interested in other things to a far greater extent; we are interested in better delivery methods; in better credit methods; in better operating methods; in the better anything that affects the practical operation of our business.

This convention should represent the opportunity for men in similar lines of business in different parts of the country to get together for the purpose of exchanging practical views and ideas; to offer helpful suggestions to one another that would be of assistance to them in the conduct of their own business; it is the exchange of this information that makes worth while the expense of this trip and the loss of several days from our business (a banquet is far too common these days to offer a sufficient excuse).

Gentlemen, it is just this that has been overlooked. This is what's the matter with the National Builders' Supply Association. This remark requires no apology, as it speaks only the plain truth, which, as Mr. Wardrop was, was to be the keynote of the convention.

Before closing these remarks I want to say just a few words of a building-up nature—so far I have been only tearing down—at the risk of repeating that which we all feel but do not always express. The worth of this association, or of any association, for that matter—in fact, its only reason for being—is measured by the amount of good it can do its members and that boiled down into plain English means the good that one member can do another. It is my firm belief, which is founded upon experience gained from membership organizations representing other lines of trade, that we members can and will help one another; make this convention what it was truly meant to be; make our association—that is, the active end of it—stand for the dealer in *builders' supplies*, and I am sure that you will have no complaint with his interest or willingness to assist in the work.

THE DEALER.

By JOHN M. CAMPBELL.

Who is the dealer? That is a question often presented to us by manufacturers, and we are always glad to answer it, because it indicates that they are giving some thought as to what is the best plan for the distribution of their materials. Some manufacturers, however, do not ask this question, and if they give any thought to the subject of the dealer, it is only to give to that word an interpretation of their own. To illustrate this will refer to just a few of such so-called dealers, that I observed only last week in several towns.

In the window of a grocery store was displayed the "For Sale Here" advertising placard of a cement manufacturer. A fine combination truly of cement, butter and spices.

A carpenter contractor buys masons materials in car-loads and peddles out what he cannot himself use.

A small mason contractor buys cement and plaster in car lots. He never had a contract large enough to use a carload, but distributes it among a number of others.

A man in the sash and door business in a small way buys cement direct and retails to the customers of the real dealers.

A plaster manufacturer forwards his material to a storehouse in another town and retails to the plasterers.

A hardware man buys cement and retails.

A plumber buys cement direct and sells at retail. I have not referred to the larger contractors who buy in big quantities direct, and so you may say that the cases cited are too small and petty to consider. In every

ROCK PRODUCTS

case noted there are real dealers in each of those towns, responsible, capable and willing to handle the materials, and to them it is a most serious matter.

These few illustrations are but examples of what is going on all over this land and the persons responsible for it cannot realize how widespread is its effect, nor to what extent this cause is responsible for the unsatisfactory conditions of the industry.

Nothing is gained, much is lost; not a dollar of value is added to the output.

Who can calculate the loss caused by the ill-feeling engendered.

These little irritations of every day hurt and do much harm. Is this not one of the poisons that contaminates the fountain head of business—the springs and streams that are the feeders of this our branch of the mighty river of commerce?

Who is the dealer? Every builders' supply man, and most of the manufacturers in our lines, accept as the correct answer the membership qualifications adopted by the National Builders' Supply Association, and that is: any firm, person or corporation regularly engaged in the building material trade and carrying a stock of masons', plasterers', sewer-builders', pavers', and other similar building material, reasonably commensurate with the demands of his community, shall be considered a building material dealer and eligible to membership in this association, when not engaged, however, in contracting or building also.

Could it be expressed much clearer? No one can misunderstand its meaning.

Manufacturers, do you not hear the call of the dealers that is growing in volume and ringing out all over this country to accept this ruling and to adopt the plan of "Selling to Dealers only"?

Dealers, in asking manufacturers to adopt this policy we must assure them that we realize that certain obligations rest also upon us, and that we will accept our share of the responsibility to make harmonious, concerted, profitable action possible.

We must give as well as receive. We owe to the manufacturers the same measure of consideration that they give to us.

Manufacturers and dealers, do we fully realize the immensity of this industry, and have we a proper conception of its high standing?

Should we not be proud of the fact that the materials we sell are the best that man has knowledge of and that is our materials that must be used for construction work to give beauty, stability and permanency?

This industry has an honorable record that can be followed back to the dawns of history. Bricks, tablets of clay, and ornamental terra-cotta are found and with inscriptions on them that can be plainly outlined today as when made by the workmen thousands of years ago.

Concrete, stone, mortar, asphaltum work of ancient times remains, and the many magnificent buildings of the older countries have stood for centuries and yet stand as monuments to the ability of the workmen and to the reliability of such materials as ours.

Cheap materials and construction have cost vast losses in this country and notwithstanding that conditions have improved by the increased use of masons' materials, yet there is so much wood used in building construction today, that the waste by fire is appalling. The following is the report on fire loss issued by the United States Government on the 7th of this month.

Washington, Feb. 7.—Fire levies on Americans an enormous tax calculated by Government officials at almost \$1,500,000 a day and 1,449 lives a year.

As a result of an investigation by officials of the Geological Survey it has been ascertained that cheaper fireproof materials can be used to advantage in construction; that three to six times the necessary amount of materials is used in structural work in the United States; that the building codes are laxly enforced; that the fire loss in the United States is eight times as much per capita as in any country in Europe, and that the great fire waste in the United States is due principally to the prevalence of frame buildings and to defective construction and equipment.

The government owns buildings that cost more than \$300,000,000, and is spending \$20,000,000 a year for new ones. Not one cent of insurance against loss by fire is carried on these buildings.

To attain this degree of security the government has gone to considerable expense, and the results fully repay the outlay. The extensive tests to determine the strength and fire resistance of building materials have been made and from them the foregoing conclusions have been derived.

Is it not manifestly our duty to the public and to our own business to check this great waste in the future by showing the folly of using inferior materials, by advocating better building laws, and by recommending the use of our materials that even time itself can hardly destroy nor fire consume?

Looking backward upon the past may be sentiment, but it teaches us to honor our calling, and it also shows the value and durability of our materials.

To give earnest thought and consideration to the great opportunities and developments in this industry of today is business, and it should bring to us those material benefits and profits which the high standing of our business and the prosperity of our country entitles us.

Notwithstanding all these many advantages, what are the actual conditions in the trade?

An immense volume of business, it is true, most of it commodities of low price, bulky and heavy, with the percentage of cost for handling very high in proportion to its value; destructive competition, great effort, little profit.

Is it not a reflection upon the intelligence and the business ability of our manufacturers and merchants that business should be so conducted?

Can we not compare this industry to an immense structure?

The giant beams and girders to represent the manufacturers, the heavy columns, the big distributors, the many smaller posts and props, the dealers—all these resting upon a foundation of our materials.

The weak beams or girders will buckle under a strain; so they will also where the span is too great and supports not used. Columns, posts and props made of inferior materials will bend or give way under the pressure. A poor foundation is a danger and a menace. A flaw at any point makes the strain greater at others and dangerous to the entire structure.

Now, to make this applicable to our business, manufacturers do not try just because you are big and strong to carry the entire load.

There may be flaws in the beams and the span may be too great.

Distributors and dealers, you must be made of the

right stuff, reinforced with a stiff backbone to give efficient support to the manufacturers. All should be tied together by the bonds of mutual self-interest.

Every one should stand upon a foundation like concrete, the aggregates composed of the rock of integrity and reliability; the sand of courage and enterprise; the cement of good will and harmonious business relations.

You must realize that to remove even one prop, or to use a column with a flaw, makes the strain greater upon the others. The support of all is needed and depended upon in proportion to your size and strength.

Build wisely and the edifice will stand as an example of business common sense, paying splendid profits for the investment.

Build unwisely and the structure will be shaken by every financial storm, while you cower in dread under the unequal burden, fearful that it will fall and destroy all that you have labored for.

Manufacturers and dealers, we should pull together. It is team work that wins; your interests are our interests; you must protect us, we must support you.

Is it not the duty of each manufacturer to create a demand for his own brands of materials? Is it not the dealer's obligation to distribute those brands of materials that the consumer wants?

Dealers also should, to the utmost of their ability, do their share to help the manufacturers and themselves by stimulating a demand for and recommending the use of such materials. This is probably more necessary in the specialties of the trade or the newer materials not so well understood by the public.

This, in a word, is cooperation. One of the great men of finance recently said: "The spirit of cooperation is upon us. It must of necessity be the next great form of business development and progress."

Ex-President Roosevelt, although he frightened the trusts, said: "We must combine with our fellows to make our influence felt."

In view of the present conditions, we must give heed to the undoubted trend of business operations.

Manufacturers and dealers, as individuals or as asso-

ciations, unite and thereby gain stability and profits to the trade.

Such alliances, operating in accordance with the laws and the "square deal," will not demand the highest prices that the public will stand for. They should strive for and obtain reasonable profits.

Trade arrangements to succeed depend largely upon confidence. We must play fair; a word not kept, a promise broken, demoralizes. Such practice is foolish, for it gives but a temporary advantage. No business can win today by sharp practice, for such people are soon lost to sight in the sink-hole of unreliability.

Dealers, should we not hesitate to buy from those who go out for business by naming cut-throat prices?

Inferior materials and inefficient service is to be expected. Is it not the part of wisdom to refrain from grasping at the immediate extra profit, when by doing so assists to bear values down to an unprofitable level?

Is it not rather our duty to help manufacturers maintain just prices to the advantage of all?

Cost or less than cost prices benefits no one. A big New York contracting firm has it right. They advertised a day or two ago "To consider prices alone is to have hold of the wrong end of the stick."

Manufacturers, any action of yours that injures dealers hurts you; if you limit his profits, your credit risk increases.

Also, when planning any change of policy or when discussing new conditions pertaining to the distribution of materials, call into conferences representatives of the dealers in the sections interested.

It is your business—true; but it is equally to the advantage of the dealers to have you succeed.

The dealers are in closer personal touch with the public, the consumers, than it is possible for you to be; also, this would tend to allay the irritation that often prevails between all branches of the business.

Dealers, the National Builders' Supply Association had its origin in the unsettled conditions of this business, and the call the association sends out to the dealers of the

country is to join and help elevate the industry to a higher plane.

Live membership in the association will take you out of the limitations of a small circle; drives out narrow ideas; gives to you the experience and often the friendship of the successful men from all sections of the country; adds knowledge that often brings direct and immediate profits. The association with others adds a new enthusiasm to your work that is worth in dollars and satisfaction many times the cost of membership.

Why are not all the dealers of the country members of this or one of the various state associations? I believe it is because of the lack of realization, of the real, tangible benefits derived. Why do they not appreciate that real fact?

Because of the general apathy of the members, who do not realize that every prop added to the structure helps themselves and gives to them some relief from the burden. Nor do they realize that "the plain duty is the near duty" and that "for each person the field of operation is the field of his immediate duty."

Association work will be of little value if it does not stimulate individual action. No man can or should do it all. He can do a man's part; his share of the work in his own locality.

Dealers, do you realize the great amount of work and the benefits you receive from the efforts of the officers of these associations?

Fail to support them, discourage them, and changed conditions might force these men, now your friends, to become your active competitors. Do not give them cause to even think of this; help them; cooperate with them, and help to bring about the common sense method of doing business; that will bring to you honest dollars for honest effort.

The very nature of the materials we deal in should be an inspiration for the present and hope for the future. As the workers take the inert and shapeless mass of little value from the earth and by their handiwork fashion it into forms of beauty, wonderful strength and great value, so let us as the workers take this unstable mass of business and, working through our organizations, following strictly the specifications of confidence, united action and honest dealings, construct an edifice of business that will stand as a monument of the highest type of commercial rectitude and, like our materials, endure forever.

It was only at the close of the convention that the aggressive spirit of the dealers was awakened to a semblance of what should pervade the meeting and it is indeed a pity that the convention could not have been continued for another day, so that the thoughts introduced and the ideas perfected might have been worked out and fashioned into action. The close of the formal proceedings of the convention occurred when Business Manager Wardrop was called upon to review the work of the convention upon similar lines, as his annual report had covered the work of the year. He showed that the opportunity was offered and that it was up to the members to act if they wanted to, and he called forth all of the arguments which have been used in the work of the year.

The following officers were elected, as reported by the nominating committee, through the chairman, D. J. Kennedy, of Pittsburg:

President—Charles Warner, Wilmington, Del.
Treasurer—Henry A. Clasen, Baltimore, Md.
Executive Committee—Frank S. Wright, Chicago; Henry A. Moore, Philadelphia; Ambrose Tomkins, Newark, N. J.; Edward Walton, Youngstown, Ohio.

Vice Presidents—
Charles E. Taylor, Little Rock, Ark.
C. J. Waterhouse, San Francisco, Cal.
Charles Bye, Wilmington, Del.
P. G. Hanahan, Atlanta, Ga.
H. H. Halliday, Cairo, Ill.
Ed Lodaon, Indianapolis, Ind.
Owen Tyler, Louisville, Ky.
J. J. Voelkel, Jr., New Orleans, La.
J. J. Kelley, Jr., Baltimore, Md.
James G. Lincoln, Boston, Mass.
C. N. Ray, Detroit, Mich.
Howard McCutcheon, Kansas City, Mo.
John Wharry, St. Paul, Minn.
J. M. Campbell, Passaic, N. J.
Henry Schaefer, Jr., Buffalo, N. Y.
J. P. Carlisle, Columbus, Ohio.
John Strouse, Pittsburgh, Pa.
Charles M. Kelly, Providence, R. I.
A. G. Gower, Greenville, S. C.
W. W. Fischer, Memphis, Tenn.
F. P. Jones, Wheeling, W. Va.
S. Dana Lincoln, Washington, D. C.
R. C. Brown, Oshkosh, Wis.
S. W. R. Daily, Seattle, Wash.
Mr. McAtee, Houston, Texas.
F. H. Johnston, New Britain, Conn.
Francis C. Sanders, Boise, Idaho.

THE ANNUAL BANQUET.

The annual banquet was held in the gold room of the Auditorium annex and there were gathered all the talent and all the power of the building materials interests of the United States. The Marine band gave beautiful music and every one present joined in the singing of the lullabies from *Rock Products*, while a delightful collation was served.

There is a limit even to the capacity of supply dealers when they sit down to their annual spread and as the interest of things to eat and drink began to wane, Chairman Willis, acting as toastmaster, spread another feast of things intellectual, which consisted of a number of addresses.

THE ATTENDANCE.

William H. Pepken, W. H. Pepken Co., Milwaukee, Wis.
J. G. Tucker, Chattanooga Paint Co., Chattanooga, Tenn.
W. T. Berthelet, Milwaukee Cement Co., Milwaukee, Wis.



GORDON WILLIS, ST. LOUIS, MO., EXECUTIVE COMMITTEE N. B. S. A.

William S. Hotchkiss, Hotchkiss Contracting Co., 1210 Manhattan Building, Chicago.
 John Dunlop, Marquette Portland Cement Manufacturing Co., Chicago.
 G. C. Eccles, Marquette Portland Cement Manufacturing Co., Chicago.
 W. H. Eccles, Marquette Portland Cement Manufacturing Co., Chicago.
 L. J. Moss, Lehigh Portland Cement Co., Indianapolis, Ind.
 Frank Holland, Lehigh Portland Cement Co., Indianapolis, Ind.
 F. E. Paulson, Lehigh Portland Cement Co., Indianapolis, Ind.
 L. F. Letterman, 2016 Mohawk, Chicago.
 George W. McCummon, L. H. McCummon, Cincinnati.
 John M. Campbell, Campbell Morrell Co., Passaic, N. J.
 Walter C. Shultz, Chas. Shultz & Son, Hoboken, N. J.
 Fred R. Charles, Richmond, Ind.
 D. L. Mather, Mather Bros. Co., Richmond, Ind.
 Edward Quebbeman, Universal Portland Cement Co., Chicago.
 L. V. Thayer, Peerless Brick Mach. Co., Minneapolis, Minn.
 F. L. Stecker, Steubenville Stone Co., Steubenville, Ohio.
 Louis Drucker, Passaic, N. J.
 H. Hudson, G. J. Parke, Decatur, Ill.
 Thos. M. Magoff, Atlas Portland Cement Co., New York City.
 George Wilson, Rock Products, Chicago.
 Jesse C. Lovelace, John H. Denies Sons Co., Memphis, Tenn.
 A. H. Lauman, National Mortar & Supply Co., Pittsburgh, Pa.
 Frank E. Malott, The Malott Coal & Lime Co., Indianapolis, Ind.
 H. C. Irwin, Springfield, Ill.
 H. A. Rogers, A. B. Keport Co., Indianapolis, Ind.
 Charles M. Kelley, James C. Goff Co., Providence, R. I.
 John W. Elchelberger, T. D. Elchelberger, Dayton, Ohio.
 Thomas L. Cannon, Convention Bureau, St. Louis, Mo.
 Charles McDonald, Cincinnati, Ohio.
 William A. Rabbe, The Kenton Supply Co., Covington, Ky.
 D. J. Kennedy, D. J. Kennedy & Co., Pittsburgh, Pa.
 Samuel Sjeldal, The Garry Iron & Steel Co., Cleveland, Ohio.
 G. J. Parke, V. H. Parke & Son Co., Decatur, Ill.
 William E. Seif, 225 Wisconsin street, Chicago, Ill.
 Charles H. Clalborne, Union Mining Company, Baltimore, Md.
 J. C. Adams, D. J. Kennedy Co., Pittsburgh, Pa.
 Henry A. Classen, Maryland Lime & Cement Co., Baltimore, Md.
 Charles Warner, Charles Warner & Co., Wilmington, Del.
 James G. Lincoln, Waldo Bros., Boston, Mass.
 Frank S. Wright, Meacham & Wright Co., Chicago, Ill.
 A. E. Bradshaw, Indianapolis Mortar & Fuel Co., Indianapolis, Ind.
 B. F. Janncke Co., New Orleans, La.
 John G. Evans, Atlas Portland Cement Co., Chicago, Ill.
 W. W. Fischer, Fischer Lime & Cement Co., Memphis, Tenn.
 J. R. Spease, Fairmont Wall Plaster Co., Fairmont, W. Va.
 J. Maxwell Carrere, Blanc Stainless Cement Co., Allentown, Pa.
 Ramon C. Vidal, Blanc Stainless Cement Co., Allentown, Pa.
 Samuel E. Matter, Standard Salt & Cement Co., Duluth, Minn.
 A. A. Koplin, Akron, Ohio.
 C. R. Bingham, Atlas Portland Cement Co., New York, N. Y.
 L. H. Harrison, Superior Portland Cement Co., Cincinnati, Ohio.
 R. P. Dolson, Thomas Phillips Co., Akron, Ohio.
 B. W. Hilles, Samuel H. French & Co., Philadelphia, Pa.
 H. W. Irons, The Central Sewer Pipe & Supply Co., Steubenville, Ohio.
 Charles L. Johnson, Southwestern States Portland Cement Co., Dallas, Tex.
 Charles A. Ernstberger, Tompkins Bros., Newark, N. J.
 D. M. Hackett, Crescent Portland Cement Co., Pittsburgh, Pa.
 H. W. Foote, G. M., N. W. Exp. Metal Co., Chicago, Ill.
 B. A. Williams, American Cement Plaster Co., Lawrence, Kan.
 Frank Steeg, Acme Cement Plaster Co., St. Louis, Mo.
 C. N. Ray, C. H. Little Co., Detroit, Mich.
 William Price Miller, N. W. Expanded Metal Co., Chicago, Ill.
 John J. Kelly, Jr., National Building Supply Co., Baltimore, Md.
 D. C. Mannan, D. C. Mannan & Co., St. Joseph, Mo.
 George D. Van Sciver, The De Frain Sand Co., Philadelphia, Pa.
 H. A. Moore, The De Frain Sand Co., Philadelphia, Pa.
 James W. Wardrop, National Builders Supply Association, Pittsburgh, Pa.
 Fred G. Langner, Langner Manufacturing Co., Cleveland, Ohio.
 D. K. Thompson, Jr., Columbus B. Supply, Columbus, Ohio.
 H. S. Rhoads, Columbus B. Supply Co., Columbus, Ohio.
 A. S. McCombe, American Sewer Pipe Co., Akron, Ohio.
 Charles Schmutz, Crescent Portland Cement Co., Youngstown, Ohio.
 J. P. Carlile, Columbus, Ohio.
 E. A. Evans, Zanesville Grain & Supply Co., Zanesville, Ohio.
 George B. Christian, Jr., Col. Builders Supply Co., Columbus, Ohio.
 A. H. Gallagher, The Ohio & Binns Retarder Co., Port Clinton, Ohio.
 P. B. Beery, Allentown Portland Cement Co., Allentown, Pa.
 F. S. Culver, Ohio & Binns Retarder Co., Port Clinton, Ohio.
 A. Y. Gowen, Cleveland Builders Supply Co., Cleveland, Ohio.
 W. T. Bosister, Cleveland Builders Supply Co., Cleveland, Ohio.
 Charles O'Donnell, Buckeye Portland Cement Co., Beliefontaine, Ohio.
 F. C. Pew, The Ohio Plaster & Supply Co., Steubenville, Ohio.
 Charles A. Matcham, Allentown Portland Cement Co., Allentown, Pa.

D. C. Henley, The Toledo Pulp Plaster Co., Toledo, Ohio.
 Bert L. Swett, Lehigh Portland Cement Co., Indianapolis, Ind.
 G. F. Ahlbrandt, American Rolling Mill Co., Middlebury, Ohio.
 F. B. Milhoan, American Rolling Mill Co., Middlebury, Ohio.
 E. A. Foster, Samuel Cabot, Inc., Boston, Mass.
 Fred K. Irvine, Rock Products, Chicago.
 B. F. Lippold, Rock Products, Chicago.
 A. J. Armstrong, Plymouth Gypsum Co., Ft. Dodge, Iowa.
 G. W. Atherton, Manufacturing & Supply Co., Boyne City, Mich.
 W. T. Akers, Akron Vitrified Clay Manufacturing Co., Akron, Ohio.
 Charles C. Bye, Charles Warner Co., Wilmington, Del.
 Jacob G. Brown, Brown & Brown Coal Co., Detroit, Mich.
 A. E. Blackmer, Blackmer & Post Co., St. Louis, Mo.
 E. L. Bernard, Bernard Bros. & Mercer Co., Burlington, Iowa.
 J. B. Blanton, J. B. Blanton Co., Frankfort, Ky.
 Ed. M. Baltes, Ed. M. Baltes Co., Ft. Wayne, Ind.
 R. C. Brown, Cook & Brown Lime Co., Oshkosh, Wis.
 E. W. Bond, Bond & Sarnow Co., Milwaukee, Wis.
 J. W. Ballard, J. W. Ballard & Co., Binghamton, N. Y.
 A. R. Black, American Gypsum Co., Port Clinton, Ohio.
 P. M. Cox, The Woodville Lime & Cement Co., Toledo, Ohio.
 P. R. Clack, General Fireproofing Co., Youngstown, Ohio.
 George T. Calvert, J. Calvert's Sons, Detroit, Mich.

George W. Jones, Evans & Howard Fire Brick Co., St. Louis, Mo.
 Charles H. Knapp, Knapp Bros. Manufacturing Co., Chicago, Ill.
 George S. Knapp, Knapp Bros. Manufacturing Co., Chicago, Ill.
 E. C. Kimball, Meacham & Wright Co., Chicago.
 Luther Keller, Scranton, Pa.
 S. T. Kavanaugh, Kavanaugh Sand Co., Memphis, Tenn.
 W. B. Lensing, H. A. Lensing, Evansville, Ind.
 George W. Lauer, Rochester Lime Co., Rochester, N. Y.
 Martin P. Louverse, S. A. Morman & Co., Grand Rapids, Mich.
 I. W. Lewis, Atlas Portland Cement Co., New York, N. Y.
 Walter F. Lauer, Rochester Lime Co., Rochester, N. Y.
 J. W. Landrum, Terre Haute Coal & Lime Co., Terre Haute, Ind.
 O. C. Maurer, Woodville Lime & Cement Co., Toledo, Ohio.
 R. H. Miller, LaClede-Christy Clay Products Co., St. Louis, Mo.
 Frank Miller, Jr., A. C. Horn Co., New York, N. Y.
 F. Meacham, Meacham & Wright Co., Chicago.
 H. C. Morrow, Chicago Clay Products Co., Chicago, Ill.
 L. W. Macatee, W. L. Macatee & Sons, Houston, Tex.
 B. F. Marsh, Worcester, Mass.
 E. L. Merriman, Paragon Plaster & Supply Co., Scranton, Pa.
 E. H. Michel, Salmon Brick & Lumber Co., New Orleans, La.
 R. B. Mather, Mather Bros. Co., Richmond, Ind.
 George N. McAlarney, Wilkesbarre, Pa.
 M. E. McCormick, American Gypsum Co., Port Clinton, Ohio.
 J. C. MacFadyean, American Sewer Pipe Co., Akron, Ohio.
 Harry S. Price, Price Brick Co., East Jordan, Mich.
 H. H. Plummer, Menasha, Wis.
 H. H. Pipkorn, H. H. Pipkorn Co., Milwaukee, Wis.
 A. E. Pruess, Utica Hydraulic Cement Co., Utica, Ill.
 Arthur N. Pierson, Arthur N. Pierson, Inc., New York, N. Y.
 H. W. Ranson, The General Fireproofing Co., Youngstown, Ohio.
 Albert Robertson, Charles A. Glore, Centralia, Ill.
 F. K. Rhines, General Fireproofing Co., Youngstown, Ohio.
 M. A. Reeb, Buffalo, N. Y.
 H. F. Rowal, The Robinson Clay Products Co., Akron, Ohio.
 W. E. Shearer, U. S. Gypsum Co., New York, N. Y.
 William H. Stone, Manufacturers Record, Baltimore, Md.
 C. B. Samuel, The Lookout Paint Manufacturing Co., Chattanooga, Tenn.
 Walter Smith, The Atlas Portland Cement Co., Ft. Dodge, Iowa.
 Francis C. Sanders, Boise, Idaho.
 Christ. Sarnow, Sand & Sarnow Co., Milwaukee, Wis.
 George W. Crouse, Jr., Akron, Ohio.
 W. H. Settle, W. H. Settle & Co., Madisonville, Ohio.
 Theo. C. Schwier, E. M. Baltes & Co., Ft. Wayne, Ind.
 John A. Strouss, Knox, Strouss & Bragdon, Pittsburgh, Pa.
 Adolf Schelling, Stone & Steen Co., New York, N. Y.
 G. H. Tefft, Dickey Clay Manufacturing Co., Kansas City.
 Henry W. Tews, Tews Lime & Cement Co., Milwaukee, Wis.
 C. M. Timmons, Kosmos Portland Cement Co., Louisville, Ky.
 Ambrose Tomkins, Tomkins Bros., Newark, N. J.
 Aug. C. Tews, Tews Lime & Cement Co., Milwaukee, Wis.
 James N. Thayer, O. C. Thayer & Son, Erie, Pa.
 F. J. Van Allen, American Sewer Pipe Co., Jackson, Mich.
 John J. Vollke, J. J. Clarke Co., Ltd., New Orleans, La.
 W. E. Viets, Lehigh Portland Cement Co., Cleveland, Ohio.
 E. S. Walton, The Youngstown Ice Co., Youngstown, Ohio.
 R. D. Hatton, LaClede-Christy, St. Louis, Mo.
 Gordon Willis, St. Louis, Mo.
 J. T. Wallace, Blackmer & Post Pipe Co., St. Louis, Mo.
 W. E. Wright, The Robinson Clay Products Co., Akron, Ohio.
 Charles Weiler, Western Lime & Cement Co., Milwaukee, Wis.
 J. H. Zinn, William E. Dee Clay Manufacturing Co., Indianapolis, Ind.
 P. Pidgeon, Pidgeon-Thomas Iron Co., Memphis, Tenn.
 H. S. Long, The Marion Dump Wagon Co., Marion, Ohio.
 J. T. Baily, Michigan Plaster Co., Grand Rapids, Mich.
 A. W. Sommers, McLaughlin Building Material Co., Chicago, Ill.
 M. E. Sommer, Robinson Clay Products Co., Akron, Ohio.
 W. A. Humphreys, V. P., Robinson Clay Products Co., Akron, Ohio.
 C. H. Stamm, Marion M. Allen, Newport, Ky.
 H. H. Mueller, John Mueller, Lockland, Ohio.
 L. C. Briggs, The Briggs Co., Lansing, Mich.
 Henry Smith, Michigan Plaster Co., Grand Rapids, Mich.
 John Mueller, Lockland, Ohio.
 P. Austin Tomes, Atlas Portland Cement Co., New York, N. Y.
 M. F. McGrath, American Gypsum Co., Detroit, Mich.
 Eli R. Cadmus, Ogden & Cadmus, Bloomfield, N. J.
 C. H. Wilson, Pres., The Cincinnati Sewer Pipe Co., Cincinnati, Ohio.
 Albert Goepper, Indianapolis Mortar & Fuel Co., Indianapolis, Ind.
 L. R. Blackmer, Blackmer & Post Pipe Co., St. Louis, Mo.
 E. H. Curtis, Clinton Metallic Paint Co., Clinton, N. Y.
 John M. Stoner, The Cincinnati Clay Products & Supply Co., Cincinnati, Ohio.
 P. Verhey, The Grand Rapids Builders Supply Co., Grand Rapids, Mich.
 F. J. Nixon, Paine & Nixon Co., Duluth, Minn.
 Marion M. Allen, Newport, Ky.
 H. Van R. Palmer, Atlas Portland Cement Co., New York, N. Y.
 O. C. Hasse, Crescent Portland Cement Co., Wampum, Pa.



E. S. WALTON, YOUNGSTOWN, O.

ROCK PRODUCTS

J. A. Pfeiffer, Northwestern Expanded Metal Co., Chicago.
R. A. Gibson, Hot Springs Concrete Co., Hot Springs, Ark.

T. Lally, Lally Column Co., Chicago, Ill.
J. C. Spencer, Spencer Bros., Chicago, Ill.
R. T. Spencer, Spencer Bros., Chicago, Ill.
P. J. Harkins, Lally Column Co., Chicago, Ill.
John Lally, Lally Column Co., Chicago, Ill.
Thomas Best, Best Bros. Keene's Cement Co., Medicine Lodge, Kan.
Roger Titus, Best Bros. Keene's Cement Co., Medicine Lodge, Kan.
F. E. Mines, A. B. Rosing Co., 435 Rookery Building, Chicago.

J. W. Stromberg, Clinton Wire Cloth Co., 30 River street, Chicago.
Morris M. Hunter, Edison Portland Cement Co., Pittsburgh, Pa.

N. J. Cary, Utica Hyd. Cement Co., Utica, Ill.
M. H. Horn, Atlas Portland Cement Co., New York, N. Y.
A. H. Scott, Atlas Portland Cement Co., New York, N. Y.
B. E. Allison, United Kansas Cement Co., Kansas City, Mo.
C. J. Parrott, McLaughlin Building Material Co., Chicago, Ill.

L. C. Koplin, The Thomas Phillips Co., Akron, Ohio.
Herman C. Thieno, H. C. Thieno & Co., Rochester, N. Y.
W. L. Hitchcock, Blackfork Co., Blackfork, Ohio.
E. G. Westerkrug, Chicago Fire Brick Co., Chicago.
Frederick E. Potter, Atlas Portland Cement Co., New York, N. Y.

Robert J. Mehren, Thomas Connely, Chicago, Ill.
C. H. Brigham, Atlas Portland Cement Co., New York, N. Y.

E. H. McGrath, D. W. McGrath, Columbus, Ohio.
John L. Cooper, The Atlas Portland Cement Co., New York, N. Y.

Frank J. Silho, McLaughlin Building Material Co., Chicago.

James M. Hamilton, Rochester Lime Co., Rochester, N. Y.

Ray C. Haynes, Acme Cement Plaster Co., Indianapolis, Ind.

W. W. Nicol, Peoria Fuel Co., Peoria, Ill.
B. M. Mitchell, McLaughlin Building Material Co., Chicago.

Joseph Mitchell, McLaughlin Building Material Co., Chicago.

W. H. Snodgrass, Snodgrass & Fullington, Marysville, Ohio.

N. D. Peters, Utica, N. Y.
Chas. Swenson, Jamestown Supply Co., Jamestown, N. Y.

J. B. John, Mgr. Superior Portland Cement Co., Superior, Ohio.

R. H. Hampson, Bethlehem Steel Co., Bethlehem, Pa.
E. N. Kearny, J. Watts Kearny & Sons, New Orleans, La.

T. M. Dyer, Alpha Cement Co., Buffalo.
S. S. Parkhurst, Chemical Stucco Retarder Co., Webster City, Ia.

Henry Mostberger, Mostberger Iron Co., Buffalo, N. Y.

Homer H. Allen, Susquehanna Coal Co., Erie, Pa.
W. H. Cramer, Chicago Fire Brick Co., Chicago.

C. A. Kimball, Atlas Portland Cement Co., New York, N. Y.

W. E. Cobean, Wolverine Portland Cement Co., Coldwater, Mich.

Jas. Denholm, The Cincinnati Sewer Pipe Co., Cincinnati, Ohio.

C. F. Harwood, The Superior Portland Cement Co., Cincinnati, Ohio.

H. F. Rauch, The Superior Portland Cement Co., Cincinnati, Ohio.

Walter C. Boynton, Concrete Publishing Co., Detroit, Mich.

Roy C. Jarvis, Port Huron, Mich.

Abraham Hartley, East Palestine, Ohio.

E. F. Knight, Bradford Pressed Brick Co., Bradford, Pa.

C. B. Graves, McLaughlin Building Material Co., Chicago.

John C. Pew, The Youngstown Iron & Steel Roofing Co., Youngstown, Ohio.

W. E. Bailey, Atlas Portland Cement Co., New York, N. Y.

George Wiseman, Atlas Portland Cement Co., New York, N. Y.

L. E. Armstrong, Plymouth Gypsum Co., Ft. Dodge, Iowa.

G. M. Ellenger, Plymouth Gypsum Co., Ft. Dodge, Iowa.

T. L. Degnan, Toledo Builders Supply Co., Toledo, Ohio.

Kennedy Stinson, Stinson-Reeb Builders Supply Co., Montreal, Que.

W. J. Gilbert, Chicago Fire Brick Co., Chicago.

Mr. Hayes, Buffalo Bldg. Supply Co., Buffalo, N. Y.

Mr. Luce, Buffalo Bldg. Supply Co., Buffalo, N. Y.

C. W. Parsons, Chief Expert City Eng. of Louisville, Ky.

T. W. Beard, Chief Asst. City Eng. of Louisville, Ky.

M. J. Bannon, Louisville, Ky.

J. A. Pfeiffer, W. W. Expanded Metal Co., Chicago.

James L. Bruff, Turner Construction Co., Buffalo, N. Y.

J. F. Lockley, Newaygo Portland Cement Co., Grand Rapids, Mich.

F. F. Ansorge, Newaygo Portland Cement Co., Grand Rapids, Mich.

J. C. Spencer, Spencer Brothers, Chicago, Ill.

T. Lally, Lally Column Co. of Chicago, Chicago, Ill.

R. T. Spencer, Spencer Brothers, Chicago, Ill.

P. J. Harkins, Lally Column Co. of Chicago, Ill.

John Lally, Lally Column Co. of Chicago, Chicago, Ill.

Thomas Best, Best Bros. Keene's Cement Co., Medicine Lodge, Kan.

Roger Titus, Best Bros. Keene's Cement Co., Medicine Lodge, Kan.

R. A. Gibson, Hot Springs Concrete Co., Hot Springs, Ark.

J. A. Pfeiffer, W. W. Expanded Metal Co., Chicago, Ill.

C. A. Owens, John D. Owens & Son, Owens, Ohio.

WISCONSIN MEN MEET.

Proposition to Form Mutual Insurance Company Will Probably Be Abandoned as Members Are Lacking.

MILWAUKEE, Wis., Feb. 23.—Indications are that the Wisconsin Clay Manufacturers' Association, which opened its tenth annual convention at the St. Charles hotel here today, will fail to organize a mutual fire insurance company.

Owing to the extreme cold weather and the consequent delay of trains, practically nothing was done at the morning session. The afternoon session opened with only about fifty members in attendance, but it is expected that this number will be increased later. The convention was called to order by L. T. Crabtree, Crandon, Wis., president of the association. After the president's address, in which he outlined the work accomplished during the last year and made suggestions for the coming year, Prof. Samuel Weidman, of the geological department of the University of Wisconsin, made an interesting talk and also read a paper, "A Message from the Last Secretary of the Association," written by Oscar Wilson, now of Donnybrook, N. D.

After the reports of various committees the convention launched into the big question of the day, the matter of organizing a mutual fire insurance company, which should be formed along the lines adopted by the hardware dealers and lumber dealers mutuals. In his address Herman L. Ekern, deputy commissioner of insurance, offered several suggestions for the formation of the company, calling attention to the fact that there must be secured at least 200 risks before the company could be launched. The fact that the association has only a little more than 300 members discouraged the sentiment in favor of the mutual. Another objection raised by J. W. Hinkley, L. T. Crabtree, George Kennedy and others was the fact that brick yards in general are deplorably lacking in fire protection facilities. As a possible solution of the difficulties Commissioner Ekern suggested that the clay manufacturers might affiliate with some existing mutual in the state.

The entire matter of insurance was left to a committee composed of Maj. J. W. Hinkley, Green Bay; L. T. Crabtree, Crandon; N. L. Meir, La Crosse; W. J. Crane, Kenosha, and Prof. Samuel Weidman, Madison.

In an interesting address on "The Importance of Drainage in Wisconsin," Prof. E. R. Jones, of the University of Wisconsin, outlined the various land types of Wisconsin, showing that areas lying in Douglas, Ashland, Marathon and Chippewa counties were greatly in need of drainage and offered a fertile field for the tile manufacturers.

The matter of exhibits was something of a disappointment, since only two were in evidence. An interesting display was made by the Manitowoc Clay Products Co., of Manitowoc, Wis., in charge of George Kennedy, and an exhibit by the Fond du Lac Pressed Brick Co., in charge of Mr. Krauer.

Wisconsin Lumberman Meet.

MILWAUKEE, Wis., Feb. 24.—With 260 retail lumbermen, 75 traveling salesmen and twenty exhibitors in attendance the twentieth annual convention of the Wisconsin Retail Lumber Dealers' Association, which opened at the Hotel Pfister yesterday, promises to be one of the most successful in the history of the organization.

President D. J. Loomans, of Waupun, opened the gathering with an interesting address, devoted almost entirely to the important subject of demurrage.

"Conservation of the Natural Resources," an address by Assemblyman W. M. Bray, well-known lumberman manufacturer of Oshkosh, Wis., was the most interesting portion of Thursday morning's session.

Assemblyman L. C. Whittet, retailer at Edgerton, Wis., gave an interesting address at the afternoon session, Thursday, on the "State Guaranty of Bank Deposits." A general discussion on the "Code of Ethics," "Odd and Short Lengths" and other topics took place.

The annual meeting of the Northwestern Lumber & Sash & Door Traveling Salesmen's Association was held at the Hotel Pfister on Wednesday evening, February 23. The following officers were elected: President, S. W. Chambers, Hudson, Wis.; vice-president, Charles Silbernagel, Madison, Wis.; secretary and treasurer, Robert Blackburn, Milwaukee; director, W. T. McGuire, Milwaukee.

The list of exhibitors was larger than usual and the displays were more extensive and of more than ordinary interest. The following is a partial list of exhibitors and those in charge:

Marquette Cement Manufacturing Company, La Salle, Ill.; John Dunlop, J. E. Hayes and A. F. Smith.

Winthrop Asphalt Shingle Company, Chicago.
Plymouth Gypsum Company, Fort Dodge, Ia. D.

E. Roberts, general sales manager; J. T. Garland, Wisconsin sales manager.

Universal Portland Cement Company, Chicago. H. MacRobert, Jr., A. C. Cronkrite.

H. W. Johns-Manville Company, Milwaukee.

The Atlas Portland Cement Company, New York. F. C. Baily.

Vulcanite Roofing Company, Chicago. W. H. Sloane.

United Roofing & Manufacturing Company. By Western Lime & Cement Company, Milwaukee.

Chicago Portland Cement Company, Chicago.

United States Gypsum Company.

SOME LIVE RETAILERS.

Members of the Pennsylvania Lumber Association Have a Fine Program at their Annual Convention.

PITTSBURGH, Pa., Feb. 18.—One of the most enjoyable and profitable trade events of the season was the third annual convention of the Retail Lumber Dealers' Association of Pennsylvania held here January 27-28. The entertainment features were in charge of the Pittsburgh Wholesale and the Pittsburgh Retail Lumber Dealers' Association, and were right royally taken care of.

Mayor Magee welcomed the visitors at the morning session on January 27, assuring them that the people of Pittsburgh were glad to have them here. To this President R. R. Thomas fittingly responded, after which the convention was formally called to order. Secretary Rightor and Treasurer Stewart submitted their annual reports. Nominations of officers for the ensuing year were made, and the auditing committee reported the affairs of the association in proper shape. Following this came the election of officers. This resulted in the selection of the following:

President—W. T. Geddes, Windber.

First vice president—Frank E. Miller, Ingram.

Second vice president—R. S. Cornelius, Butler.

Treasurer—A. J. Stewart, Washington.

Secretary—A. C. Rightor, Pittsburgh.

At the afternoon session Secretary Arthur L. Holmes, of the Michigan Retail Lumber Dealers' Association, and Secretary George W. Hotchkiss, of the Illinois Lumber Dealers' Association, made addresses. Then came a general discussion, and at 3 p. m. the members visited the plants of H. J. Heinz Co. and Westinghouse Electric Co.

There were some big doings in the evening at the Fort Pitt Athletic Club where a "smoker" and vaudeville show was given, and fun, fun, and then more fun, was the order of the night.

Discussion and talks on various subjects such as "Mail Order Problem," "Parcels Post," "Demurrage," "Arbitration," and "Contracts With Your Orders," occupied the attention of the convention at the morning session, January 28. Selection of the place for holding the July meeting was left to a committee, and after a formal board meeting the members again went sight seeing.

In the evening a banquet was given at the Monongahela house by the Pittsburgh Retail Association, at which the eloquent and witty James W. Wardrop presided as toastmaster. Congressman A. J. Barchfeld, of the Pittsburgh district, addressed the guests, and was followed by Carroll F. Sweet, president of the Michigan Retail Lumber Dealers' Association, and A. F. Sheldon, president of the Sheldon Schools of Salesmanship.

New Cement Brick in Chicago Markets.

A. E. Preuss, representing the Universal Brick Company, Utica, Ill., is displaying a new cement product in the shape of a very fine brick. It is made very much after the system of the sand lime brick, and is a product of very high merit. The brick will be handled in the Chicago market by the brick department of the Meacham & Wright Company, whose brick show rooms are located in the Chamber of Commerce Building.

New Building Material Co.

OKLAHOMA CITY, OKLA., Feb. 15.—The Contractors' Materials Co. has been incorporated for the purpose of handling as jobbers all kinds of building materials. It will also act as manufacturers' agents for firms desiring Southwestern representation. The company has already made arrangements to act as sole distributors of Hartshorne crushed rock, and the Elephant brand of Portland cement.

Here's An Odd Corporation.

NEW YORK, Feb. 19.—Among the corporations recently chartered in this state is the Metropolitan Artificial Stone Works. It has a capital of \$200,000, and will buy and sell lands containing timber, gypsum, sand and cement material. The incorporators are: Leonard Wilkens, New York; Gerard H. Gernerds and Herman Schriekart, Brooklyn.

ROCK PRODUCTS

FEBRUARY 22, 1910.

THE SOUTHWESTERN

Lumbermen's Association Hold Their Twenty-second Annual Convention at Kansas City.

KANSAS CITY, Mo.—The twenty-second annual convention of the Southwestern Lumbermen's Association was held in Kansas City January 25 and 26. A new program was tried out this year in holding the sessions. The arrangement was to meet but once a day and that in the morning. The meetings were held in the Century Theater, which was packed at each session. According to the official register, 1,300 names were recorded by the secretary. One of the features of the meeting was the Hoo-Hoo concatenation, which was held at the Railroad Men's Club rooms. The meeting was called to order by President W. D. Frantz, of Enid, Okla., who presided over the sessions, with Harry A. Gorsuch in the secretary's chair.

The first day's session consisted of the report by the secretary and a report by Treasurer J. H. Foresman. President Frantz then made his annual address, which was very comprehensive in its nature.

D. Austin Latchow, who is a member of the Missouri Forestry Commission, gave a very interesting paper on the state forestry work.

Arthur L. Holmes, secretary of the Michigan Retail Lumber Dealers' Association, read a paper on "The Wholesalers' Interest in the Retailers' Association."

At the closing session of the convention, the election of officers was held and the following were elected:

President—C. E. Mathews, Webb City, Mo.

First Vice President—Howard E. Case, Wichita, Kan.

Second Vice President—A. F. Parkinson, Wagoner, Okla.

Treasurer—J. H. Foresman, Kansas City, Mo.

Directors—H. C. Leonard, Girard, Kan.; A. L. Scott, Bern, Kan.; John Atwell, Chillicothe, Mo.; W. M. Johns, Sedalia, Mo.; W. D. Frantz, Enid, Okla.; L. R. Putnam, Fayetteville, Ark.

A handsome souvenir badge was distributed with the compliments of the Ash Grove Lime & Portland Cement Company, of Kansas City, and deserves special mention on account of its unique design and the excellence of taste and workmanship which it represents. Made entirely of metal, it is cast in the form of a Zeppelin dirigible balloon. The car is loaded with shingles, cement, lath, sash and doors, and undoubtedly shows the plan this company has in mind for making its future deliveries.

THE EXHIBITS.

As usual, there were a large number of exhibits in connection with the convention and every available inch of space in the big Coliseum was occupied by cement manufacturers and builders' supply men. There were a number of sash, door and lumber concerns exhibiting besides the firms catering to the cement, lime and plaster retail business.

The Peerless Brick Machine Co., of Minneapolis, Minn., had an exhibit in charge of President L. V. Thayer, assisted by J. J. Palmer. Mr. Thayer, who has gained such eminent distinction in foreign parts, was a busy man during this convention demonstrating the brick-making ability of the Peerless machine. Needless to say he booked a number of orders, and said regarding his recent trip to Can-

ada that the Canadian National Exhibition awarded the Peerless machine a diploma for cement brick machines. This exhibition is held in Toronto and is one of the national events of the dominion.

The Atlas Portland Cement Co. had a space where they met their friends and they passed out booklets on concrete, and in fact gave out information on any kind of concrete work, especially Atlas information. Walter Smith and I. W. Lewis, Atlas representatives in this territory, were in charge.

Frank Willeke, of the Hunkins-Willis Lime & Cement Co., St. Louis, was on hand to meet the friends of his company.

The American Cement Plaster Co. of Lawrence, Kan., had an exhibition of their product in practical use. This consisted of a plaster board on which was plastered material manufactured by that company. The glad hand was extended to all the visitors by Genial B. A. Williams, who, if he does not know a caller, will soon get acquainted. He was assisted by C. W. Huffine, James Undine, W. J. Ong and A. P. Williams.

The Acme Cement Plaster Co. have a space where they met their friends. This was in charge of Frank Steeg, general sales agent, of St. Louis, and R. Vance Steele, the Kansas City representative.

The Acme Woven Wood Lath Co., of St. Louis, was represented by Vice-president B. H. Ward. He had a sample of the Acme woven wood lath, of which he explained the merits to each visitor. Mr. Ward says the lath is making a hit and he expects to have four new mills manufacturing this product before very long.

The Marblehead Lime Co. had a prominent space and it was crowded all the time with visitors looking at their samples of hydrated lime. A new use of hydrated lime was demonstrated on a number of boards shown, which were painted with a mixture of hydrate and linseed oil. There were also a number of surfaces finished with a mixture of hydrate and Portland cement to show the workings of these two materials and how much lighter the concrete can be made by using a mixture with hydrate in it. This was demonstrated for the purpose of encouraging cement plaster exteriors and the use of hydrated lime in concrete mixtures. Manager W. J. Stewart was assisted by his lieutenants, W. J. Staley and L. D. Scott. They were reinforced by A. E. Newton, superintendent of the company, and C. E. Marvin, of the sales force, from the Chicago office.

The Ste. Genevieve Lime Co., of St. Louis, was represented by Chas. H. Hollmann. He had a number of samples of Ste. Genevieve lime, which is manufactured of limestone of oolitic formation and very white in appearance. The exhibit attracted considerable attention and Mr. Hollmann made many friends during the convention.

The Oriental Cement & Plaster Co. had an exhibit of their product in a finished wall surface. This is a new concern whose mill is located in New Mexico, where they have a large deposit of gypsum from which they manufacture plaster. The exhibit was in charge of Manager N. R. McBurney, of the Kansas City office.

The north end of the building contained the combined exhibits of the Western Cement Manufacturers' Association. The placing of these exhibits was in charge of W. B. Hill. The exhibit was in charge of W. H. K. Bennewitz and Ivan de Mitzkiewicz. The exhibit was surrounded by a wall of con-

crete blocks, which were manufactured by the Horton Concrete Construction Co. Other manufacturers whose products were shown were the U. S. Champion Roof & Tile Maching Co., who manufacture concrete shingles; concrete blocks manufactured by the Kansas City Coal & Material Co.; ornamental concrete posts from the shop of the Jennens Manufacturing Co.; blocks made on the X L concrete brick machine and fence posts from the American Concrete Fence Post Co. The center of the exhibit contained a large piece consisting of a base on which reclined a lion. This was of concrete. There was also a very handsome fireplace of concrete blocks and brick, together with vases, urns and garden furniture of concrete. Wooden forms for manufacturing concrete hog dipping vats and forms for posts and silo construction were also shown. The bags containing the brands of the manufacturers were strung up over the balcony and gave an idea of how many manufacturers there were in this district. The sales force of each of the operating companies in Kansas City were on hand to look after their manufacturers and those of others who attended the convention.

The Ash Grove Lime & Portland Cement Co. was represented by E. A. Coates, W. C. Deacon and W. A. Lapham.

The Kansas City Portland cement works of the Union Sand & Material Co. was represented by Sales Manager W. A. Smith, and R. A. McNally.

The Iola Portland Cement Co. was represented by H. E. Whitney, C. A. Barell and C. M. Hellmuth.

The United Kansas Portland Cement Co. was represented by A. W. Rinne, R. F. DuRosey, Ed. Sherrick, L. P. Simpson, O. O. Stone, F. T. Singleton and W. F. Faque.

The Western States Portland Cement Co. was represented by C. H. Miller, M. Prentiss, G. W. Young, H. S. Haynes, M. J. Bowdish, William Edwards and William Scofield.

D. E. Roberts, sales manager of the Plymouth Gypsum Co., of Ft. Dodge, Iowa, was on hand to meet the customers of his company. He circulated around the Coliseum and met many of his old-time friends. Mr. Roberts thinks the year 1910 is going to be a hummer in the building trade.

F. W. Farrington, H. E. Reynolds and J. L. Watson, of the United States Gypsum Co., were on hand to meet the friends of that company. It is hard to get away from any of this bunch and they are live wires when they are on the job at a convention.

Colonel W. A. Raupp, of the Pierce City Lime Co., of Pierce City, Mo., mingled with the association members during the convention. The genial Colonel said that the past season had been a very satisfactory one and that the coming year bids fair to be the biggest he has ever had.

F. O. Gulley, general manager of the Ozark White Lime Co., of Fayetteville, Ark., was on hand to meet his many friends. Mr. Gulley says the outlook for the lime business is the best ever and he anticipates a great trade this year.

F. F. Freeman, president of the Rogers White Lime Co., of Rogers, Ark., said the outlook for this year looks pretty good to him. Lilly lime will be distributed more widely than ever through the pushing of Mr. Freeman and his lieutenants.

ILLINOIS DEALERS

**Held Interesting Meeting at the La Salle Hotel
Last Day's Sessions were Given Over to the
Mason's Supply Association.**

February 18 saw the closing session of the twentieth annual convention of the Illinois Lumber Dealers' Association and the fifth annual convention of the Illinois Masons' Supply Association. The meeting has been in session for three days at the La Salle Hotel.

February 16 and 17 were given over to the deliberations of the lumber dealers, which was in the form of papers, addresses and discussions pertaining to the lumber trade in Illinois.

Following this, E. M. Hagar, president of the Universal Portland Cement Co., was called upon for an address on "The Cement Question from the Manufacturers' Standpoint."

Mr. Hotchkiss then told of the conference held last December between the retailers and the manufacturers at the La Salle Hotel. How a committee of eight retailers had been appointed to meet the manufacturers, and that he hoped that soon the meeting could be arranged.

The election of officers resulted in the following being chosen:

President, N. E. Holden, Danville, Ill.

Vice-President, Edw. Cheaney, Petersburg, Ill.

Directors, J. W. Paddock, Pana, Ill.; H. H. Halliday, Cairo, Ill.

A strong appeal was made by President Holden and Secretary Hotchkiss for the members to help increase the membership, after which the convention adjourned sine die.

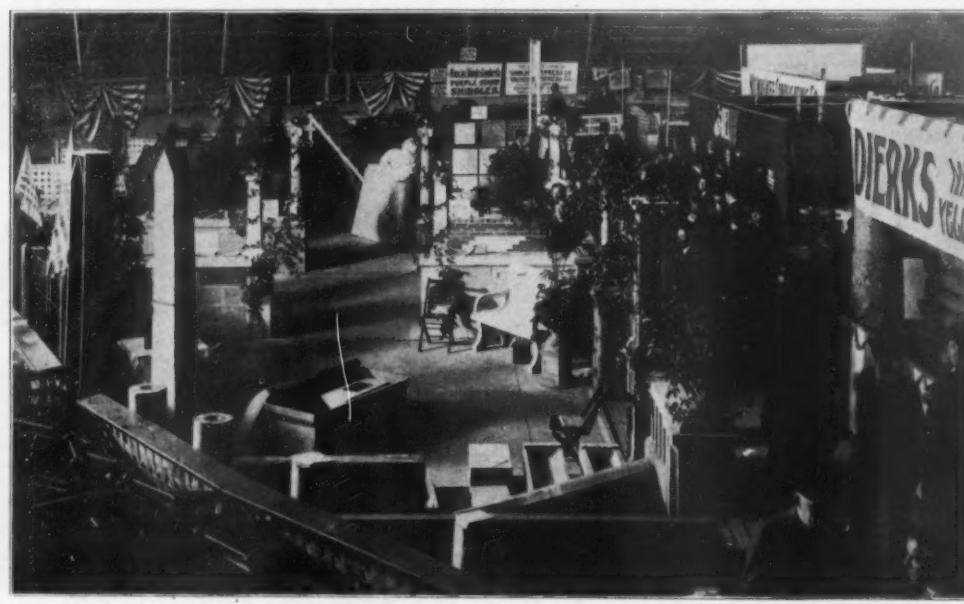


EXHIBIT OF CEMENT PRODUCTS AT THE SOUTHWESTERN LUMBERMEN'S ASSOCIATION.

ROCK PRODUCTS

29

INTERSTATE TILE MEN MEET.

The annual convention of the Interstate Cement Tile Manufacturers' Association held its first meeting at the Lexington Hotel Tuesday morning, February 22.

The meeting was called to order by President L. L. Bingham, of Estherville, Ia. Owing to the sickness of Secretary Chas. E. Sims of Worthington, Minn., he was unable to be present and Vice-President D. G. Keith of Ceylon, Minn., acted in his stead.

The cement tile industry is one of the growing branches of the concrete industry, and in the past few years it has developed more largely probably than any other branch. The association organized a few years ago, has made rapid progress and it is doing some very effective work under the leadership of its able officers.

The president introduced Norman D. Fraser, vice-president of the Cement Products Exhibition Company, who gave a very hearty welcome to the visitors. He said he hoped that their meeting would be profitable to them and as this was the first time they had met in Chicago, that the attendance would be large. He extended a very hearty welcome on behalf of the city and the Cement Products Exhibition Company. The response on behalf of the tile manufacturers was made by Dr. Baldwin of Coldwater, Mich., who thanked Mr. Fraser for his welcome.

Informal discussions were entered into and President Bingham called on the representatives of power machines to discuss the merits of their machines in connection with manufacturing tile.

C. D. Doolittle, of the X L All Cement Machine Company, spoke on the merits of the Ferguson cement tile machine. As Mr. Doolittle is an experienced tile manufacturer himself, he gave a very comprehensive talk on the various phases of the cement tile industry and answered numerous questions that were put to him by the members.

C. C. Quinn, of the Quian Wire & Iron Works of Boone, Ia., was called upon to speak on the merits of his tile machine. He said they had been making large sized tile and it had been found very satisfactory where it had been used. Mr. Quinn was also asked a number of questions by the various members.

As it had reached the hour of noon, the meeting adjourned.

February 22. Afternoon Session.

President Bingham called the meeting to order in the convention room of the Lexington Hotel. He called upon George Deickmann, chief chemist of the Northwestern States Portland Cement Co., for a discussion on steam curing cement tile.

Mr. Deickmann said that he had been making a number of tests on steam curing cement products, the results of which are published in a pamphlet issued by his company. He said he did not believe that it was necessary to sprinkle concrete tile after it had been steamed. They intend to continue their experiments on tests for the next year, using different mixtures and treating them in different ways. He warned tile men about having steam too hot. It should be introduced into the curing room moist. The curing room should be kept at a temperature of 80 to 90 degrees cent. and the steam should be kept at about the same temperature. The most important chemical action in tile takes place during the first twelve hours. In the first forty-eight hours, 50 per cent of the tensile strength of the tile is developed. In seven days about 75 per cent has been developed. In twenty-eight days 85 per cent has been developed, and to attain the maximum strength of the cement it takes from one to two years. He advised that the steam should not be applied to the tile until the initial set had taken place or at about the end of seven hours after the tile had been made. A good way to test the tile would be to see if an impression could be made by a finger mark.

Dr. Baldwin gave some very interesting information on the subject of steam curing. He said that he had a curing room 11 feet by 100 feet in length. Two-thirds the length of this kiln he had a tank 4 feet by 8 feet and 2 feet deep. In this he kept cold water. Steam pipes from the boilers are connected with this tank and the steam therefore had to pass through the water in order to circulate through the curing room. He said excellent results had been secured by this method.

Considerable discussion was created on this subject after which Mr. Deickmann read a paper on the subject of "The use of Cement in Winter."

After the reading of this paper, the president named the following nominating committee: Messrs. Sokol, Girth and Baldwin.

President Bingham then called upon E. A. Shaver for a talk on "Plant Location and Equipment." Mr. Shaver said that he had operated a plant at Wellman, Ia., to which he was obliged to ship his sand and make a haul of over a mile to the plant. Besides this, he was obliged to compete with a clay tile plant, which was against him. He moved last year

to Columbus Junction, Ia., and is now located near his supply of sand as well as having four railroads for shipping facilities. He forcibly impressed on the manufacturers the necessity of being near the raw material supply.

P. H. Atwood then gave a strong talk on "The Necessity of Adopting the Standard Specification for Cement Tile," and supplemented these remarks by a paper on this subject. As he is chairman of the committee in charge of the specifications, he urged the members to carefully consider the suggestions offered by the committee before Wednesday morning.

Following this, a discussion was entered into by various members on "The Use of Sand in the Aggregate—To What Proportion the Fine and Coarse Should Be Mixed, Etc." Dr. Baldwin presented a very strong talk in regard to proportion. He said that no set rule can apply to proportioning the aggregate. No two sand pits are alike. The best way to find the proportion is to fill a box with sand and measure the water to find out the amount of voids in the sand then to allow the same amount of cement to be applied in this aggregate in order to fill the voids.

The president then made the announcements for the next day's session.

The executive session of the Interstate Cement Tile Manufacturers' Association was called to order by President Bingham in the convention hall of the Lexington Hotel for the morning session of February 23. A large number of other manufacturers had arrived in the city for this session and much enthusiasm was displayed. The session was for the members only and it was one of the best that has ever been held by the association.

The principal topic under discussion was "Manufacturer's Cost, Data, Profits, and Labor Saving Devices." One report presented was by far the most interesting paper that has ever been presented on this subject. It was by J. H. Libberton, assistant inspector engineer Universal Portland Cement Co. of Chicago. Mr. Libberton has spent several months visiting the various cement tile plants and collaborating the data which was contained in his report. It consisted of the cost of manufacturing cement tile and labor saving devices in plants as well as the manufacturing of machinery for handling the products. He illustrated his talk with stereopticon views of the many plants he has visited as well as pictures of work in which cement tile has been used.

His paper was followed by discussions from the various members on this subject which was entered into very heartily.

The report of the secretary, Chas. E. Sims, was read, as well as the report of the treasurer, Geo. F. Keil.

The election of officers then followed. President L. L. Bingham, who has so faithfully served the association, felt that he had so many other duties to occupy his time and attention that he would be obliged to retire from his office. P. H. Atwood, Armstrong, Ia., was elected to the office of president. The other officers elected were: Vice-president, D. G. Keith, Ceylon, Minn.; secretary, Chas. E. Sims, Worthington, Minn., and treasurer, Geo. F. Keil, Sherburne, Minn.

The session then adjourned.

February 23. Afternoon Session.

The meeting was called to order by President Bingham at 2 o'clock. The first on the program was a paper by Geo. F. Sokol, Sibley, Ia.

W. G. Middleton, Emmetsburg, Ia., was then called upon to answer objections to the use of concrete tile, which he did in a very excellent manner, though the only objections to concrete tile are those raised by competitive manufacturers. He told of arguments that are raised by the manufacturers of other tile products and the result of some of his findings.

Frank M. Okey, who has charge of the testing laboratory of the State University at Ames, Ia., was in the audience and President Bingham called upon him for a few remarks. Mr. Okey is an enthusiastic cement advocate. He gave a very comprehensive talk on how tests are made to determine the various properties of concrete. He said that set rules in proportions do not stand. In manufacturing concrete of any kind he believed that just as much water as could possibly be put into the concrete in order to make it stand up is the proper way to manufacture it. Following his remarks, he was asked a number of questions and his opinion of various statements that had been made at this and other sessions of the association. In regard to steam curing, he said he believed that better results could be obtained by turning live steam under pressure into the curing room.

C. F. Hunt, Lafayette, Ind., was then called upon for a talk on "Should Concrete Tile Be Dense or Porous?" Mr. Hunt is a strong advocate of porous tile and he backed up his statements very emphatically by giving some figures that had been given him by various customers of his in Indiana.

THE ATTENDANCE.

- H. E. Chatterton.
- F. L. Taylor, Mount Pleasant, Mich.
- C. D. Pierce, Ottumwa, Ia.
- J. H. Libberton, Chicago, Ill.
- A. P. Southworth.
- J. R. Moffatt, Union City, Ind.
- F. A. B. Patterson, Fairmont, Minn.
- W. M. Brown, Mount Pleasant, Mich.
- E. N. Helm, North Liberty, Ia.
- C. F. Hunt, Lafayette, Ind.
- J. H. Morse.
- E. S. Magowan, Minneapolis, Minn.
- J. C. Mason, Fremont, Neb.
- L. L. Bingham, Estherville, Ia.
- J. H. Whelp, Bancroft, Ia.
- R. Humphrey, Clarion, Ia.
- F. P. Mayne, Mitchell, S. D.
- F. P. Field, Quincy, Mich.
- J. H. Haynes and E. L. Haynes.
- R. N. Knuts, Dows, Ia.
- O. L. Smith, Quincy, Mich.
- W. H. Kelling, Ceylon, Minn.
- E. Macomber, Winterset, Ia.
- J. C. Van Doorn, Minneapolis, Minn.
- C. C. Quinn, Boone, Ia.
- E. N. Egge, Maraborn, Mo.
- A. B. Sawyer, Maraborn, Mo.
- D. G. Keith, Ceylon, Minn.
- A. W. Schweiße, St. James, Minn.
- J. R. Herrington, Edinburg, Ill.
- B. Latta, Tekamah, Neb.
- P. E. Morey.
- D. W. Radichel, Mankota, Minn.
- Jos. Smith, Quincy, Mich.
- C. J. Lavee, Gowrie, Ia.
- W. C. Reynolds, Sheffield, Ia.
- F. M. Atwood, Armstrong, Ia.
- T. J. Hess.
- C. J. Davis, Timewell, Ill.
- C. Doolittle, Webster City, Ia.
- Geo. Sokol, Sibley, Ia.
- C. Stoker, Stanwood, Ia.
- F. M. Hill, Osage City, Ia.
- Geo. Schumaker, Clarion, Ia.
- W. G. Middleton, Emmetsburg, Ia.
- E. A. Shaver, Columbus Jct.
- W. D. Shuttleworth, Sibley, Ia.
- Mr. Nichols, Farmer City, Ill.
- A. A. Ariff, Grand Mound, Ia.

Notes of the Chicago Cement Show.

Joseph F. Lockley, of the Newago Portland Cement Co., of Grand Rapids, is mixing with his customers at the Cement Show.

Sasgen Brothers of Chicago, who are exhibiting a builders' derrick on the balcony, say they are away behind with their orders at the present time.

The T. L. Smith Co.'s booth is a center of activity. Charles Smith, vice-president of the company, is in charge, assisted by a corps of "mixers," and they are certainly mixing it up in the mixer field. The perfection and quality of the Smith mixer is clearly demonstrated at this exhibition and Mr. Smith reports numerous sales, spread over a large territory.

C. L. Johnson of the Southwestern States Portland Cement Company, Dallas, Texas, now talks like a "Suthner" and he says that Texas brand of Portland cement manufactured at their mill is the greatest product you have ever seen. Moyer, Boyer and the rest of his old pals down east will be green with envy when they discover the quality of the cement manufactured by the Southwestern Cement Company's mill at Dallas.

S. M. Chase, president of the Chase Foundry Manufacturing Co., Columbus, O., was not bothered any when told he would have to get his entire exhibit out of the annex, in the Cement show by Sunday night. He has sold all special cars in the exhibit, manufactured by his company for block, brick, tile, wet concrete, dry concrete, sand, gravel and clay. The purchasers of these cars will have to do the moving.

W. Williams, of the Williams Construction Supply Co., of Columbus, Ohio, was one of the busiest men at the Cement Show yesterday at booth 20-23. He sold S. M. Burnett, the most prominent contractor in Rockford, Ill., a concrete mixer and later in the day sold the leading contracting firm of Sevest Brothers, of Bloomville, Ohio, a street machine complete. This firm is young, progressive and growing, and is not afraid to keep strictly up-to-date in its equipment necessary for its large operations.

George Marsh, the genial president of the Marsh-Capron Manufacturing Co., Chicago, was on the job with both feet. While Mr. Marsh is too busy a man to attend the show with any regularity, the exhibit is ably taken care of by E. F. Heywood, assisted by about twenty real "mixers." This exhibit is composed of the Marsh-Capron tilting mixer, Marsh-Capron non-tilting mixer, Simpson mixer, Duplex post machine, Barrow curb and gutter system, concrete barrows and carts. Anyone at all interested in the concrete field should not fail to call at booths 51, 52, 53 and 218, 219, Annex, where the Marsh-Capron family is holding court.

Concrete

IOWA ASSOCIATION

Of Cement Users Will Hold Their Sixth Annual Convention at Cedar Rapids.

Both President George H. Carlon and Secretary Ira A. Williams were in attendance at the Chicago Cement Show and secured quite a number of exhibitors for their show, which commences March 9 and continues until the 11th.

They say the interest in the show is keener than ever and that the attendance is sure to be large. There will be a larger number of exhibitors than ever this year.

This is the sixth annual convention of the Iowa Association and Cedar Rapids is one of the best cities in the state to hold a convention and show in. The Montrose Hotel will be convention headquarters and all delegates should go there to register and receive the proper credentials.

PROGRAM.

A strong program of instructive and entertaining papers and addresses has been arranged. Sessions will be held in the auditorium of the Carnegie Library on Wednesday afternoon, the 9th; Thursday morning and evening, and Friday morning, March 11.

Some changes may be made and some additions to this list, but the different numbers will be presented substantially as follows:

Wednesday Afternoon, 1:30.

Address of Welcome—Mayor M. J. Miles, Cedar Rapids.

Response—J. C. Burch, Iowa Portland Cement Co., Des Moines.

President's Address—Geo. H. Carlon, Oskaloosa.

Cement in Government Irrigation Work (illustrated)—C. J. Blanchard, U. S. Reclamation Service, Washington, D. C.

Permeability of Concrete—F. M. Okey, Iowa State College, Ames.

Appointment of committees.

Wednesday Evening.

Local entertainment.

Thursday Morning 9:00.

Effect of Cold on Cement—G. P. Dieckmann, North-western States Portland Cement Co., Mason City.

History of Cement and Its Uses—H. M. Herald, Assistant City Engineer, Burlington.

Cement Sidewalks and Floors—Jesse Hines, Greenfield.

Steam Curing of Cement Products—G. E. Tathwell, Cedar Rapids.

Thursday Afternoon.

Inspection trip to places of interest about Cedar Rapids.

Thursday Evening, 8:00.

Cement in Street Work—C. T. Wilson, City Engineer, Waterloo.

Surface Finishing of Cement Work—P. P. Comoli, Sioux City.

Modern Manufacture of Portland Cement (illustrated)—G. P. Dieckmann, Mason City.

Specifications for Cement Tile—A. Marston, Iowa State College, Ames.

Reports of committees.

Friday Morning, 9:00.

Concrete Work in Freezing Weather—W. B. Wallace, Cedar Rapids.

Concrete Bridge Construction—T. H. MacDonald, Iowa Highway Commission, Ames.

Manufacture and Use of Cement Tile—P. H. Atwood, Armstrong.

Illustrated Address—President R. L. Humphrey, National Association of Cement Users, Philadelphia.

Adjournment.

Cash Prizes for Concrete Blocks.

The accompanying illustration shows a fine sample of a building built exclusively with Hercules concrete blocks. This brand of block has attracted attention wherever used, and when put to the test has come through without a black mark against it. In this case the building is not only everything that could be desired structurally, but its appearance is unusually pleasing. It is a dormitory in Southern Indiana.

The Municipal Contractors.

The third annual convention of the Illinois Association of Municipal Contractors was held February 23 and 24 at the La Salle Hotel, in Chicago.

This association is composed of about seventy-five municipal contractors, most of whom are located in the smaller towns of the state. The officers of the association have been very energetic in pushing both the work and the association and for the purpose of carrying on a campaign have established an office at 805 Atwood building, Chicago. The object of this association is:

To promote and encourage and facilitate the making of public improvements.

To secure a higher degree of accuracy in the legally prescribed procedure and proceedings.

To collectively bear the expense incident to the making of abstracts of legal proceedings and the examination thereof.

To stimulate the market and the demand for approved improvement bonds and protect the contractors against unwarranted exactions and unreasonable discounts.

To secure better specifications for public improvements, a greater uniformity in the specifications, and where practicable, a classification of the various branches of public work.

To improve the quality, quantity and efficiency of public improvements.

To eliminate from specifications for public work conditions which are onerous to the contractor and wasteful to the public.

To secure at the hands of public officers equitable treatment and better and more just consideration.

To cultivate a closer tie of fraternalism among contractors.

To improve and relieve conditions and relations in which we have a common interest.

To initiate, promote and encourage the enactment of legislation tending to carry out the objects of this association.

Its membership is composed of firms making a business of contracting for municipal public works in the state of Illinois. The discussions at the La Salle Hotel were along the lines of co-operated effort for the good of the association and the interests it represents. An effort will be made to assist the convention of city officials and engineers in the adoption of standard specifications for paving.

The association was heartily in favor of assisting the supply dealers to eliminate the undesirable contractor. A campaign will be started against the man who is not responsible and who will not pay his bills. Also an effort will be made to eliminate the man who slighted the quality of construction.

A special inspector will be employed by the association who will travel over the state and inspect the work of contractors. He will report both to the association and the city in which the work is being done. The object of having this man is to have an unbiased opinion as to construction.

Informal discussions prevailed throughout the entire convention and were heartily entered into by each and every member present.

Election of officers resulted in the following being chosen:

President, Patrick McCarthy, Moline, Ill.
First vice-president, S. A. Tuttle, Decatur, Ill.
Second vice-president, J. A. McGarry, Chicago.
Third vice-president, John Cherry, Jacksonville.
Fourth vice-president, Morris Hoeffkin, Belleville.
Secretary-treasurer, I. T. Lain, Bloomington.
The next convention will be at Chicago in 1911.

Plans For Canadian Cement Show.

LONDON, ONT., Feb. 16.—Officers of the Canadian Cement and Concrete Association are making great arrangements for their second annual cement show which is to be held at Princess Rink in this city March 29-30-31 and April 1. Manager A. M. Hunt, who is the director general of the "big show," is already receiving entries at a rate which makes it certain that the exhibition will be a whopper. Many prominent American firms will be represented, the matter of duties on goods shipped here for exhibition purposes only having been satisfactorily taken care of. Goods under \$100 in value will be admitted, and may be shipped back without intervention by the customs authorities. In instances where the goods are worth more than \$100, a certificate must be obtained from a U. S. consul at the border. With this, and a duplicate invoice for the consul's inspection, the exhibitor will have no trouble with the customs officials.

The first allotment of space will be made February 28. This allotment will be made by a drawing of exhibitors' names, the first one out of the box to have first choice of space, etc. After this, if there is any space left, it will be assigned in the order of application.

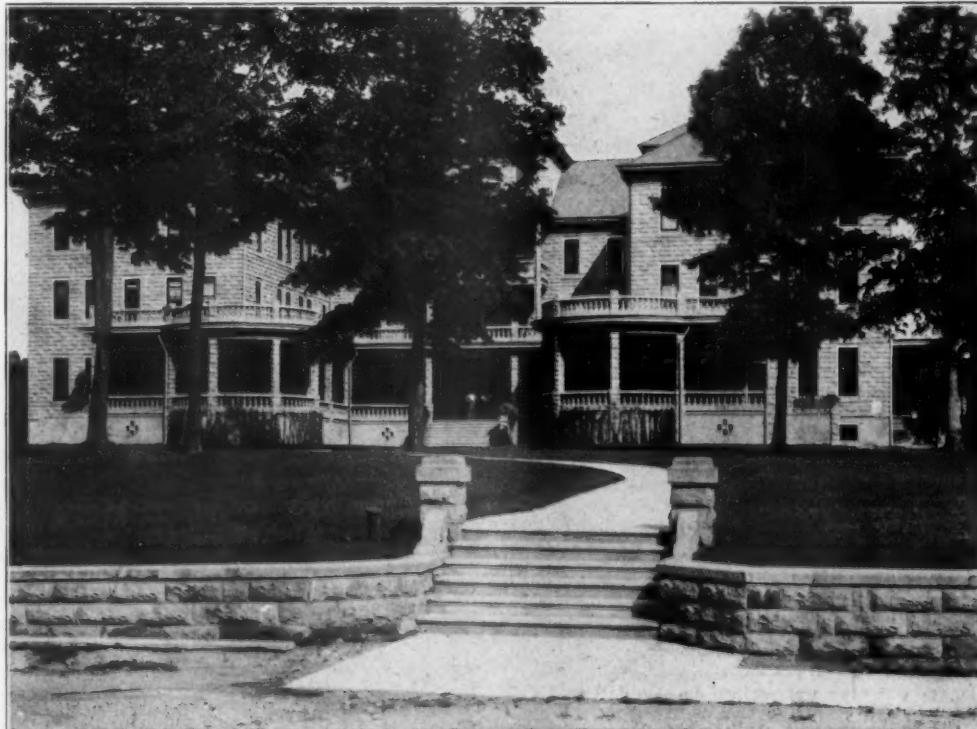
Goods for exhibit, freight prepaid, may be consigned to the management and will be cared for, without responsibility on the part of the management for loss of any kind.

There are only 63 spaces provided for, and it is almost a certainty that there will be more applicants than can be accommodated. The show was a big success last year. It bids fair to be a still bigger one this year.

Completion of Shoshone Dam.

DENVER, COLO., Feb. 18.—The Shoshone dam, just finished, is a solid block of concrete 385 feet high, and we really forget how big in its other dimensions. It is by far the biggest single stone, natural or artificial, that man ever tamed to his uses. The dam is cemented solidly into the granite walls of the canon; but even without this binding it would stand. It is a gravity dam: that is, a dam whose mere weight is sufficient to hold it in place against the pressure of the water.

"This huge structure marks the culmination—for the moment—of a steady increase in the use of concrete. It is hard to understand how the present age could have got on without this ugly, but handy building material," says an exchange.



BUILDING OF GOSPEL TRUMPET CO., ANDERSON, IND., BUILT WITH HERCULES CONCRETE BLOCKS.

Artistic Home Built of Concrete Tiles.

There are many people who are willing to admit that concrete construction is desirable, but who insist that its artistic possibilities are limited. It is in dispelling this idea, and in proving that he who is possessed of esthetic sensibilities can satisfy them to the full in a home of that construction that the most important "missionary work" that can be done is being carried on by those interested in the industry. The result is being made known in the erection all over the country not only of business edifices but of homes which are economical in construction, fireproof and sanitary, and also beautiful and pleasing to the eye of the artist.

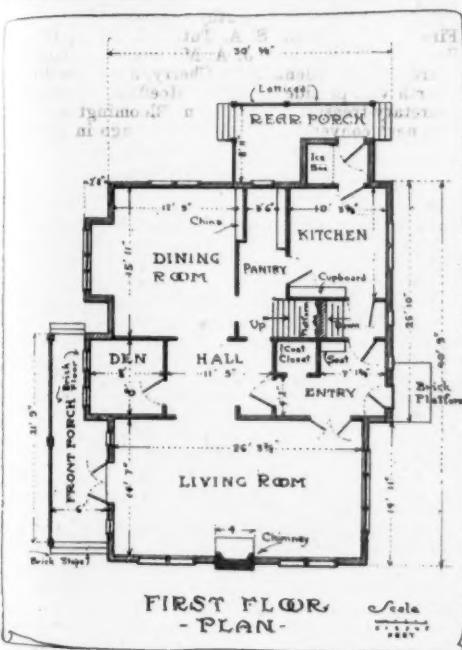
One of the factors which has helped to make this combination possible is the Pauly tile, now being very widely and successfully introduced by Albert A. Pauly, manager of the Concrete Stone and Sand Company, of Youngstown, O., whose invention is finding that the tile is not only answering every demand put upon it, but is going even further. When the tile was first put out, it was expected that it would prove a boon in that it would be a cheap, safe, strong building material, which the owner of a humble cottage could afford as well as the builder of a magnificent mansion, and that it would make the erection of buildings constructed with a large fire hazard both unnecessary and extravagant.

The tile has done all of this, and is coming into more and more general use just because of these pre-eminent qualities. But it is also doing more, and examples are being multiplied of homes which are being built of Pauly tile and which are not only splendid types of construction but are also exceedingly beautiful, and peers of homes built of the most costly types of construction.

One of the most striking of these is just being completed at Youngstown. It is the home of Angus Wade, one of the leading architects of that city, and was designed by him with Pauly tile specified. It is located on Fairgreen Avenue, one of the most fashionable streets in the residence district of Youngstown. There are a multitude of pretty homes in the neighborhood, and that of Mr. Wade is easily comparable to any of them, although in most cases they cost more than his own.

The Wade residence shows that the artistic possibilities of a concrete home are limited only by the genius of the designing architect, and in this case they have been utilized in the best ways possible. The result is that the residence does credit to the tile, to Mr. Wade and to Youngstown.

About 4,700 tiles were used in building the house, and these were plastered in cement color. The arrangement of rooms is rather odd, as will be shown by the accompanying illustrations showing the floor-plans, but this singularity only enhances the attractiveness of the comfortable home. All of the wood-

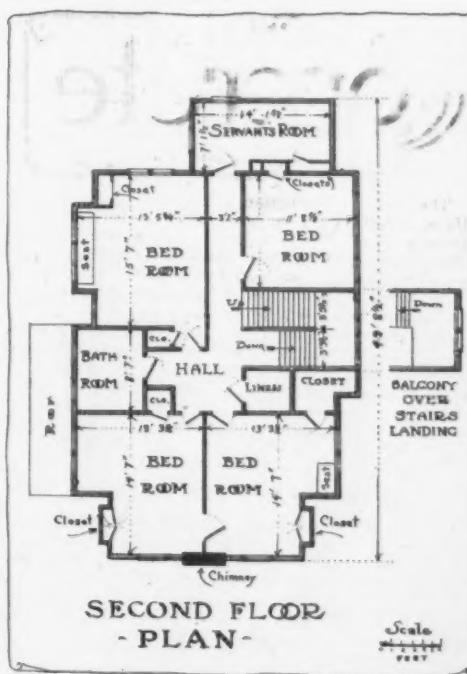


Extensive Work in Wisconsin.

SUPERIOR, WIS., Feb. 19.—The Hile-Patterson Co., of Pittsburgh, Pa., has been awarded the contract for erecting a concrete mixing plant on the Minnesota Steel Co.'s property on the St. Louis river. The big concrete plant, which will cost approximately \$100,000, will be used to mix the concrete for the foundations of the big blast furnaces and buildings which are to be started this summer. The plant will have a mixing capacity of several thousand tons of concrete a day.

The Hile-Patterson Co. already has a crew of men here erecting rigs on the Carnegie coal dock. A part of this crew will be sent to the steel plant site shortly and in addition new men will be brought here from the east.

The work on the cribs for the concrete bridge piers at the site of the railroad bridges across the St. Louis river is progressing and the work of putting in the concrete will commence shortly. One of the piers is already completed and the others will be rushed as fast as possible, as the steel work on the new bridge is to be started this spring.



work is finished in mission style. The walls are tinted, those on the lower floor being of a uniform olive green color, while the bedrooms on the second floor are finished in different tints.

The house is fitted with all modern improvements, including a vacuum cleaning plant of great power. Owing to the weatherproof qualities of Mr. Wade's home, his expenses for maintenance will be cut to a minimum, while those of his neighbors will require constant repainting and repairs, upon deteriorating parts. Taken as a whole, this residence is a splendid example of what may be done with concrete material not only in the way of erecting strong and substantial structures, but beautiful and artistic ones as well.

Concrete Dam in Idaho.

Bates & Rogers, of Chicago, Atlanta and Spokane, have received a contract to construct a concrete dam across the middle fork of the Clearwater river at Kooskia, Id. The dam will be constructed for the purpose of generating power and providing boating grounds in connection with plans for important industrial improvements to be made at Kooskia by Chicago capitalists who acquired extensive interests there early last year. It is estimated the initial improvements, which will consist of the dam, power plant, cement factory and sawmill, will cost at least \$1,500,000 and that the company plans to make this investment within the next eighteen months. A pulp mill of large capacity is also planned and arrangements for the purchase of suitable timber from the forest reserve have been negotiated. The engineering features are directed by W. J. Bell, of Denver.

Concrete Construction is Profitable.

The first concrete building of any importance constructed in the Metropolitan district, says the New York Evening Post, was built for a borax company at Bayonne, N. J., in 1898. Since that time there have been more than two hundred buildings constructed in this immediate vicinity at a cost for the buildings themselves of more than \$15,000,000. In the same time there have been constructed in the United States in the neighborhood of 4,000 buildings, which represent a total investment of capital of about \$150,000,000. Of these buildings, 200 exceed seven stories in height. These figures, considering the short commercial life of this method of construction, are truly impressive.

It will be found that the reinforced concrete building, which may have cost 10 per cent more initially than a brick and mill construction building, will show year by year, in spite of this higher first cost, a saving of from 1½ to 3 per cent.

Thus, for example, a concrete building costing \$110,000 compared with the same building put up in mill construction at \$100,000, would save from \$1,500 to \$3,000 per year. Capitalizing this at 6 per cent you have from \$25,000 to \$55,000. In other words, an owner could afford to pay in the neighborhood of \$30,000 more for a fireproof reinforced concrete building than he could for a semi-fireproof brick and wood building.



HOME OF ANGUS WADE, YOUNGSTOWN, O., BUILT OF PAULY TILE.

NEBRASKA.

Fifth Annual Convention of Cement Users Well Attended—Fine Program and Many Exhibitors.

The annual convention of the Nebraska Cement Users Association was held February 1st to 4th at Lincoln, Neb. The attendance compared very favorably with that of former years, and the interest in the association in Nebraska is not in any way diminishing. The headquarters of the convention were at the Lincoln Hotel, where the sessions were held. The large auditorium which, though some distance from the hotel, was well attended and contained the exhibits of the various machinery manufacturers and others selling material to the cement users.

During the meeting several important changes were made in the constitution and by-laws of the association to make the association broader in its field of endeavor, and the committee having this matter in hand spent considerable time working on this before they reported.

The executive committee arranged to have the sessions of the convention meet in the evening so that the daytime could be given to the inspection of the exhibits and for social intercourse.

President L. E. Porter, of York, presided over the session in a very able manner. Peter Palmer, of Oakland, was in the secretary's chair.

FEBRUARY 1st SESSION.

The Convention hall at Lincoln was well filled with members when the call was made by President Porter. He addressed the association and welcomed the members to the annual meeting.

The address of welcome to the city was made by W. A. Selleck, president of the Commercial Club of Lincoln. He extended a very cordial welcome to the members and hoped that their meeting would be profitable to them and that their stay in Lincoln would be a pleasant one. He invited the visitors to make the city hall the headquarters for the crowd and hoped they could consider the city theirs while they were there. The response to this address was made by H. C. McCord, of Columbus. He thanked Mr. Selleck for the warm welcome and assured him of the place Lincoln holds in the community.

Secretary Palmer then read the minutes of the last convention which was held at Lincoln. These were approved by the convention. Following this, he read the report of the meeting of the Executive Board.

The Committee on Constitution and By-laws which was appointed last year reported the changes they suggested. On motion of G. F. Lillie, this report was laid on the table to be considered during the convention and to be voted on at the last day's session.

H. C. McCord, chairman of the Committee on Specifications of Sidewalks, read the report of that committee. These specifications were also laid on the table to be considered at a later session.

The president then appointed a nominating committee consisting of A. J. Jones, W. H. DeBolt, W. H. Crane, Frank Whippleman and I. E. Watenpaugh. Tom Daugherty, of Auburn, Neb., gave a talk on "The Concrete Block." This was followed by a lengthy discussion on the merits of concrete block as a building stone.

Elmer E. Blackman, archeologist of the State University, gave a talk on "Waterproofing Cement Blocks." Following this speech, a lengthy discussion on the subject of waterproofing was participated in by all the members.

The president then made several announcements for the following day.

FEBRUARY 2d SESSION.

President Porter called the meeting to order at 7:30 p. m. The minutes of the previous session were read and approved.

C. R. Lehrack, of Lincoln, Neb., then gave a paper on "Art in Cement Stone." He spoke of the high development to which the manufacture of concrete has been carried. He made reference to an addition on a building of the Harvard University, which was built of granite to which a wing was added and this of concrete. The contractors had so perfectly imitated the granite that it requires the closest scrutiny to determine which is the granite and which is the manufactured product. He said that concrete could be produced that will be fully as beautiful as any natural product. The use of cement products will, he thought, assist in the conservation of the forest resources. He said that co-operation was necessary for the industry to develop to its fullest extent.

The next subject on the program was "Practical Hints to Advance the Cement Industry." This was taken up and discussed very thoroughly. The first question taken up was "The Use of Concrete in the Corn Crib and Granary." The second question was "How to Waterproof a Cellar When There Is Seepage." The third question was "Concrete Plaster on Wire Lath." The fourth question was "The Use of Salt in Concrete."

It was a late hour when the convention adjourned and after this there were informal remarks on the discussions.

FEBRUARY 3d SESSION.

The president called the meeting to order at 8 o'clock, and called on C. A. P. Turner, M. Am. Soc. C. E., of Minneapolis, Minn. Mr. Turner's remarks were supplemented by illustrated stereopticon views of work of this nature.

SHORT SPAN BRIDGES.

By C. A. P. Turner, M. Am. Soc. C. E., of Minneapolis.

In the comparatively level prairie country of the central section of the United States perhaps more is expended on short span bridges than the larger and more imposing engineering structures.

The increased use of machinery on the farm and the automobile for pleasure has caused a demand for better highways and more permanent crossings. The expense



H. C. McCORD, PRESIDENT NEBRASKA CEMENT USERS ASSOCIATION.

to the taxpayer of the breaking down of one of these short span bridges under the threshing machine, and the loss involved by an accident of this kind, has accentuated the demand for better and more permanent structures.

The old style wood bridge with plank floor soon deteriorates by wet or dry rot. Plank wears out and a structure originally safe becomes dangerous in the course of a few years. The same difficulty is found in the steel bridge with plank floor. Plank requires frequent renewals and in few of the counties in this work so systematized that it is given the attention that its importance warrants.

Through the sections of the country similar to this portion of Nebraska, where the soil is to a considerable depth loam and clay, there is more or less difficulty getting a good foundation for a concrete arch without excessive expense. Even at that the cost of a steel span with the permanent floor, due to the present methods of letting such work, frequently is as expensive as this type of bridge, when well designed.

Where unyielding abutments can be secured at moderate cost, as where hardpan and rock are but a few feet from the surface, and particularly where the grade of the roadway is at a considerable height above the foundation, the arch is perhaps the most suitable form of concrete construction.

Where, however, the usual conditions prevail the flat slab type of concrete bridge is cheaper, more readily constructed, and is not subject to the danger of destruction by settlement of the foundation as was the case in the concrete arch at Peoria, Ill.

All that is required in the way of foundation is a large, flat plate of concrete, sufficient to keep pressures down to one and one-half or two tons per foot, a comparatively light reinforced wall with slab resting thereon. Where the slab is cast integrally with the walls the walls do not have to be excessively thick to form substantial retaining walls for the abutments. Another advantage which the flat slab has over the arch is that it gives the maximum clearance so that where a thirty-foot span slab can readily be used over a creek with ample clearance a fifty or sixty-foot arch would be required were that style of structure adopted.

For viaducts the flat slab type has many advantages. Simplicity of centering and light weight as compared to the arch type of construction, requiring much smaller foundations. From the standpoint of appearance, if properly treated, the flat slab type will look equally as graceful as the more familiar arch form.

We have here a number of views, illustrating this

type of bridge, and among them one flat slab bridge 60' wide in the city of St. Paul, which is carrying the double track interurban cars with spans 37x29' approximately.

We have also some views of a viaduct on the Mississippi boulevard, which is of the mushroom type; also views of the Town and Country Club bridge. This has the main arch with independent ribs and the flat slab type of floor. Many have the idea that this type is somewhat lacking in stiffness because the depth is small compared with that of ribbed construction. I may say in respect to stiffness that in the Lafayette Street bridge which we have illustrated there is no perceptible vibration under the passage of the heavy interurban cars at fair speed.

At the Town and Country Club bridge a fifteen-ton roller was used to test the structure and they were unable to determine whether the deflection was 1/32 or 1/50 of an inch.

Another claim which the concrete structure has for consideration of the county engineer is the fact that the work can be executed by local men if they are willing to do it honestly. Such a structure when once complete does not deteriorate but grows stronger with time in strong contrast to the steel bridge and timber structure. It requires no painting, no attention and practically no repairs. It can be built where gravel can be readily secured for the average selling price of the steel beam bridge with plank floor.

In the treatment of the top or wearing surface of the slab for traffic we have found it desirable to use a coat of coarse sand or small gravel and pitch. This cushions the surface of the concrete so that it appears to stand severe traffic with no material abrasion and has proved very satisfactory indeed, as far as our experience has gone.

Following this was a paper on the subject of "Concrete Roadways" by B. F. Lippold of ROCK PRODUCTS. He was unable to be present and this paper was read by Bernard L. McNulty, a member of the staff of ROCK PRODUCTS.

Following this paper discussion took place on the subject of "The Advisability of Concrete Roadways." This was a very interesting session as a number of county commissioners and others interested in the good roads movement were present and took part in the discussion.

FEBRUARY 4th SESSION.

This session being the last one, it was arranged to hold it in the morning as many of the members were obliged to leave for their homes on the afternoon train.

The meeting was called to order by President Porter at 9:30 o'clock.

Secretary Palmer read the minutes of the previous session. These were approved.

A "Ten Minutes' Talk on Cement Tile" was given by G. F. Lillie, of North Bend, Neb. He said the manufacture of concrete drain tile as a machine-made product dates back but a few years; concrete, however, has been used in sewer construction for thirty-five or forty years. Concrete drain tile is a very profitable industry, if the raw material does not cost too much. The most essential feature in the manufacture of drain tile is to have clean sharp sand which must be screened through a half-inch screen. The tile should be made as dense as possible. The tile should be made very wet and when coated will be impervious to moisture, so that when laid water can only pass through the joints. There must be great care shown, Mr. Lillie said, in the curing.

Following Mr. Lillie's remarks a discussion was entered into by the various members.

CONCRETE PAVING FOR NEBRASKA.

By H. C. McCORD, COLUMBUS, NEB.

In the past three or four years at our conventions we have listened to papers and discussions on the many products and the different phases of cement. At this time our president has asked me to make a few remarks on the subject of concrete paving in Nebraska. In doing this we must refer largely to cities where these conditions exist, and in doing so we feel that we are safe in not springing anything on you that you have not already had an opportunity of being posted upon.

There was a time when municipalities looked with envy upon their neighbor who had laid plank and stood wooden blocks on end like little soldiers, then to make them secure from the ravages of the elements they covered them with a coat of hot tar. In other cases we find that the wooden block did not appear substantial enough for some cities, so they tried that old-time granite. In using the granite block it was found to be very expensive, and while durable it was insanitary and very noisy.

Later we have the asphalt, which was the most up-to-date paving and conceded to be among the most desirable, although not substantial for heavy traffic.

While it is not our desire to cast any reflections upon this material, for like all other good paving it has called for concrete to make it what it is. In considering the asphalt paving we must not overlook the clay product, of which we as cement users are continually up against, not only from a paving standpoint, but on every turn where this product can be forced in.

In taking up these past experiments in pavings we find that the old wooden blocks have passed away, the granite block has been cast aside on account of expense, the creosote block is being used but little, the asphalt is not substantial for heavy traffic, and conditions have narrowed down the materials for paving to two—that of brick blocks laid on a concrete base and concrete.

Now that we have referred to some of the pavements of the past, we should look to those of the present and future. In so doing we shall look to our own state and those about us.

ROCK PRODUCTS

We find Chicago has more concrete paving than any other city, and according to the Board of Public Improvements the maintenance is less than any other.

One of the Wisconsin cities laid over five miles of concrete paving last year; several of Iowa's best cities have adopted concrete paving; the little intermountain city of Bozeman, Mont., has her main street, 100' wide and a mile long, laid with concrete pavement. Salt Lake City and Denver are among the cities that are using this class of paving. We also have several towns in our own state that are laying concrete paving.

One of the great difficulties in getting more cities to adopt this class of paving is that we, as cement users, do not know how to place the matter before our city councils and citizens. We do not impress upon them that the concrete paving is the best, the most practical and in nearly every case cheaper than any other. When the town or city you live in talks about improving the streets you as cement users should not fail to show your people that you have the best proposition there is, and give examples by referring to California having a dozen or more cities using concrete paving, also a number of cities and towns in Idaho, Utah, Montana, Colorado and even Missouri.

We have several specifications for the construction of concrete paving and no cement user should be behind on this class of construction. In Nebraska we have all the aggregates within easy shipping distance, while brick blocks, asphalt, creosote and granite blocks have to be shipped into the state. There are several towns in the state that are agitating the laying of some kind of paving this year, and it behoves you to get busy and tell your people the good qualities of concrete paving.

It has not been my aim to give you any elaborate display of data, but to remind you as cement users that we must not be satisfied in making a few thousand square feet of street crossings or a few building blocks, water tanks, etc., but keep on the upward move to advance the products that we are so earnestly upholding, and if we do this the farmer of the future will be hauling his product to market over concrete roads, and the man in town or city will be taking his family for a drive on the cleanest, most sanitary and substantial paved streets of concrete.

Secretary Palmer then read the report of the Committee on Specifications of Side Walks. These specifications, as drawn up, are practically the same as incorporated in the specifications of the National Association of Cement Users. These were adopted and it was decided by the association that a copy of the specifications be sent to every municipality in the state so that a uniform sidewalk would prevail in every town.

The report of the Committee on Constitution and By-laws was then read by Mr. Krieger. The principal change in this constitution was in the qualification of members. The change reads as follows: "Any person or company engaged in the construction or manufacturing of work in which cement is used, or qualified by business relations or practical experience to co-operate in the business of this association, or engaged in the sale or manufacture of machinery or supplies for cement users, or a man who has attained eminence in the field for encouraging architecture or compiled science is eligible to membership in this association."

The report of the Auditing Committee was then presented and accepted. The books of the treasurer showed that there was on hand \$483.02.

The Committee on Resolutions then reported as follows:

Resolved, That the association extend a vote of thanks to W. A. Selleck, president of the Commercial Club, of Lincoln, for his hearty welcome to the city and use of the club rooms during our stay.

Resolved, That a vote of thanks be given the Commercial Club for the many courtesies shown during our stay in the city.

Resolved, That we extend a vote of thanks to the following persons for their services on the program: E. E. Blackman, Archeologist of the State University; C. A. P. Turner, M. Am. Soc. C. E., Minneapolis; B. F. Lippold and B. L. McNulty, of ROCK PRODUCTS; F. Daugherty, of Auburn; C. R. Lehrack, of Lincoln, and G. F. Lillie, of North Bend.

Resolved, That we extend a vote of thanks to the trade and local press for space given in the respective papers.

Resolved, That we extend a vote of thanks to the Lincoln Hotel for having furnished a convention hall in which to meet.

Resolved, That we extend a vote of thanks to the officers, the Board of Directors, as well as to Miss Palmer for services rendered to the secretary.

Resolved, That we extend a vote of thanks to the exhibitors who helped carry on the show.

Following this the election of officers ensued and resulted as follows:

President: H. C. McCord, Columbus.

Vice-President: G. F. Lillie, North Bend.

Secretary-Treasurer: Peter Palmer, Oakland.

Directors: T. C. Daugherty, Auburn; C. J. Tracy, Loup City; and I. E. Watenpaugh, Western.

The convention then adjourned.

THE ATTENDANCE.

L. E. Porter, York.	John Grabach, Grand Island.
H. C. McCord, Columbus.	George Trunkenholz, Eagle.
H. V. Grantham, Lexington.	Wm. Martin, Fremont.
C. A. Overstreet, Lexington.	F. E. Oberg, Pander.
G. F. Lillie, North Bend.	Lon Wilson, Fairfield.
Frank Berger, Hastings.	John Palmer, Wausa.
George Trumble, Syracuse.	

J. M. Krieger, Rising City.
 H. R. Park, Bruning.
 J. W. Wallick, Albion.
 Burt, Martin, Albion.
 W. B. Farris, Albion.
 D. Maisenback, Wilber.
 L. E. Barns, Alinsworth.
 E. L. Watenpaugh, Western.
 Peter Kim, Tecumseh.
 W. E. Pierce, Wilsonville.
 T. J. McAdams, Red Cloud.
 W. E. Owens, Omaha.
 T. C. Daugherty, Auburn.
 J. N. West, Ulysses.
 N. J. Morehouse, Bellingham, Wash.
 E. L. Watenpaugh, Western.
 Carl Tuchenhausen, Gordon.
 J. H. Kim, Tecumseh.
 W. H. De Bolt, Beatrice.
 T. E. Guthrie, Brumley.
 George Stanley, Wilber.
 C. R. Lehrack, Lincoln.
 C. J. Tracy, Loup City.
 Leon W. Mathewson, David City.
 J. C. Powers, Republic, Kan.
 O. W. Albertson, Republic, Kan.
 A. B. Brown, Republic, Kan.
 Wm. L. Keller, Kearney.
 E. R. Edwards, Kearney.
 W. R. Tolbot, Hebron.
 A. J. Jones, Bennett.
 F. N. Mossman, Mason City.
 Leon Custer, Tecumseh.
 Wm. Keithley, Superior.
 C. E. Lowe, St. Edwards.
 W. F. Schneider, Cedar Bluffs.
 W. H. Crane, Arlington.
 C. M. Merillat, Winfield, Ia.
 Chas. Panavanscoy, Lawrence.
 Henry Gruber, Nehawka.
 C. H. Gill, Surprise.
 Artificial Stone Co., Brumley.
 Simpson & Son, Guide Rock.
 Saunders Bros., Red Cloud.
 Milo Brown, Sutton.

Fred Robertson, Peru.
 H. H. Cowton, Hastings.
 W. H. Daugherty, Wahoo.
 Wm. Acheson, Superior.
 E. L. Bateman, Bethany.
 H. H. Stobbs, Fairmont.
 A. Loestedt, Wellfleet.
 H. A. Brown, Brock.
 C. Clason, Wayne.
 C. N. Stonecker, Seward.
 W. H. Moses, Ord.
 J. C. Ries, Haylock.
 James Finney, Ashland.
 Birt Wells, Wann.
 J. E. Sharer, Hebron.
 A. T. Cooper, Cortland.
 W. W. Cameron, Chester.
 J. W. Shutt, North Platte.
 D. M. Dean, Lincoln.
 Sunderland Bros., Omaha.
 John Craven, Exeter.
 W. F. Roney, Grand Island.
 T. H. Bolte, Kearney.
 M. Brecken, Comstock.
 E. C. Rhienhart, Aurora.
 Shelby Artificial Stone Co., Shelby.
 Ideal Cement Stone Co., Omaha.
 D. Boshart, Milford.
 W. J. Speals, Wood River.
 A. C. Hollingsworth, Beatrice.
 A. D. Sears, Fremont.
 Chicago Lumber Co., Blue Hill.
 C. L. Fulwider, Blue Hill.
 F. W. Jones, Clatonia.
 L. Moss, Angus.
 E. J. Erford, Staplehurst.
 J. A. Duke, Merna.
 D. H. Merritt, Lincoln.
 P. C. Merillat, Winfield, Ia.
 F. E. Eno, College View.
 Alfred Honde, Panama.
 D. C. Eno, College View.
 S. W. Brown, University Place.
 Peter Palmer, Oakland.
 W. F. Misegadis, Lorton.
 Platte Gravel Co., Cedar Creek.
 Alvin Misegadis, Lorton.
 Bud Latte, Tekamah.

stration was sold to the Lincoln Supply Company, of Lincoln, Neb. Mr. Thayer also booked a large number of orders and expressed himself very well satisfied with the convention.

The Merillat Culvert & Core Company, of Winfield, Iowa, demonstrated the Merillat core for concrete culvert construction. The exhibit was in charge of P. C. Merillat, assisted by C. C. Merillat. A feature of this core is that it is displayed at various sizes ranging from twenty to forty-eight inches in diameter. The sections are eight feet in length and the apparatus is equipped with trucks so that it can be easily moved about. Mr. Merillat said the company had been in operation since last August and their sales had been remarkably large. The business at this convention was very gratifying and they secured a large number of orders for their machines.

George C. Christopher, of Wichita, Kan., exhibited the Eclipse concrete block machine. This exhibit was in charge of F. L. Christopher and F. W. Grabendike. They reported that business during the convention was very good with them.

The Keasbey & Mattison Company had an exhibit of their asbestos shingles. This exhibit was in charge of A. A. Avery and Allen Koch, of the Omaha office. They said that business was very good with them and that they had placed a large number of orders for their shingles.

The Miracle Pressed Stone Company, of Minneapolis, had a section of concreto culvert in which their culvert form was in place, and a practical demonstration was given of the working of this adjustable form, and attracted considerable attention. This was in charge of R. O. Miracle.

The Ashland Steel Range and Manufacturing Company, of Ashland, Ohio, had a display in charge of H. A. Bentz. This exhibit consisted of a U. S. Standard mixer and a U. S. Standard concrete block machine with the numerous pallets which go with these machines.

The Kent Machine Company, of Kent, Ohio, had a Kent continuous mixer on exhibition. This was in charge of A. L. Post. Mr. Post said that he had a very good business and the prospects for the year were excellent.

W. L. Keller, of Kearney, Neb., exhibited his concrete block machine and concrete mixer.

The Rex concrete block machine, of Mason City, Iowa, was demonstrated by W. L. Phillips and C. L. Wilson. This machine makes blocks especially for concrete block silos, tanks, etc.

The Diamond Concrete Company, of Chicago, had a display of the Diamond automatic block machine. This machine makes a steel lining interlocking hollow block, made face down by the wet process. They also had a concrete tile machine on display. This was in charge of P. D. Diamond, president of the company.

The Kramer Automatic Tamper Company, of Peoria, had a Kramer tamper on display and demonstrated the use of this machine in connection with the manufacture of concrete blocks.

The Hayden Automatic Block Machine Company, of Columbus, Ohio, exhibited a Hayden automatic block machine with its various pallets and posts.

C. A. Van Wert, of Kendallville, Ind., demonstrated the use of the Perfect brick machine.

W. H. DeBolt represented the John H. Van Steen Company, Inc., of Beatrice, Neb. This company is one of the large dealers in supplies and handles the Bonner Portland cement, Laramie and Ivory plaster. Mr. DeBolt said that his company had enjoyed a splendid year and were looking forward to 1910 as being the banner building year in Nebraska.

G. F. Lillie, of the North Bend Cement Tile Manufacturing Company, North Bend, Neb., is an enthusiastic and progressive concrete drain tile manufacturer. He had at the auditorium cement tile which were displayed at the Nebraska Lumber Dealers' Convention a few weeks previous. He showed a splendid quality of tile and demonstrated the superiority of this product for such purposes.

Mausoleum at Springfield, Ill.

SPRINGFIELD, ILL., Feb. 21.—The National Mausoleum Co., recently incorporated at Shelby, O., is to erect a concrete mausoleum here with 1,000 crypts. Deputy Coroner R. A. Lowe, of Edwardsville, has been appointed special representative for the company in this city.

The mausoleum will be located in the Oak Ridge cemetery and will be a handsome structure. It will be 80x120 feet and will be rock faced with white marble trimmings. The interior will be of marble with the exception of the crypts, which will be of concrete. These crypts are arranged in series and each will bear an appropriate inscription. The officers are: W. Q. Hood, president; B. F. Friedley, vice-president; J. W. Cherrown, secretary, and H. W. Hildebrand, treasurer. The terms for burial are \$250, which may be paid in three installments.

NORTHWESTERN

Cement Products Association Hold Enthusiastic and Largely Attended Meeting in Chicago.

The Northwestern Cement Products Association held its opening meeting in parlor D 38 of the Great Northern Hotel, Chicago, Friday, Feb. 18, at 2 o'clock. In spite of the snow storm of a few days ago, there was as large an attendance as had been anticipated. Every member present was enthusiastic on the subject of cement and with the anticipation of attending the big cement show.

On account of the illness of Martin T. Roche, president of the association, Mr. Kingsley presided at the meeting, and W. C. Berry, Minneapolis, was appointed temporary secretary.

E. M. Hagar, president of the Cement Products Exhibition Company, delivered the address of welcome and urged the association to work for the advancement of the cement industry, which has a brighter future today than any other field of commercial activity.

O. U. Miracle, of the Miracle Pressed Stone Company, Minneapolis, read an interesting address on "Cement Sewer Pipe," and A. W. Menk, of the Consolidated Elevator Company, talked on "Concrete Country Grain Elevators." Both of these papers were discussed at some length by the members.

SATURDAY'S SESSION, FEB. 19.

The second session of the Northwestern Cement Products Association was held and some of the business of the organization transacted. There was a good crowd of delegates present and the enthusiasm manifested at the first meeting was still maintained.

A. H. Laughlin, Lisbon, N. D., who was snow-bound and missed the official train from Minneapolis, was on hand at Saturday's session and assumed his duties as vice-president.

J. V. Godfrey, Moorhead, Minn., read a most interesting address on "A Concrete Cattle Barn," which was discussed freely. There was also quite a little discussion on the subject of what was necessary in making a good concrete. The point was brought out that good pure water was essential in getting good results. Some members said they were unable to get satisfactory results when river water was used, and that the trouble seemed to be that in certain localities river water as well as certain spring or well waters contained too much alkali. The importance of pure water, free from traces of alkali in any appreciable quantities, was admitted by all.

Saturday afternoon was given over to a visit to the Universal Portland Cement Co.'s mill at Buffington, Ind. Many members of the association had expressed a desire to see a cement mill and go over the process in detail of making cement. Accordingly the Universal boys arranged for a trip and the excursion train pulled out at 2 o'clock and back at 6 p. m., in time so that it would not interfere with the evening engagements of those who made the trip. When they all returned they were wiser, but admitted that a cement mill is about as dusty a place as a country road in the summer time after six weeks with no rain.

MONDAY'S SESSION, FEB. 21.

The last session of the sixth annual convention of the Northwestern Cement Products Association opened Monday morning in the Great Northern Hotel. The following addresses were made: "Cement Products in the Northwest," by A. H. Laughlin, Lisbon, N. D.; "Surface Finish for Concrete Work," J. H. Chubb, and "Sheet Steel Piling," by J. R. Hoppin.

C. A. P. Turner, C. E., Minneapolis, was slated to talk on the subject of "How the Engineer Can Help You," but he was not able to be present.

Richard L. Humphrey, president of the National Cement Users' Association, addressed the convention and spoke on the work to be done by associations such as the Northwestern Cement Products Association. He also urged the delegates to remain the rest of the week and spend their time attending the convention of the National Cement Users' Association. Many of them expect to do this.

A telegram was sent to Martin T. Roche, president, who has been sick for weeks, expressing the sympathy of the association, with the sincere hope for his speedy recovery.

The nominating committee, composed of O. U. Miracle, chairman; R. K. Hofoss and W. S. Kingsley, submitted the following report, which was adopted:

"Your committee on nomination beg leave to report as follows:

"Inasmuch as articles of incorporation have been adopted providing for the election of officers on the

first Monday in October of each year, we recommend that A. H. Laughlin, of Lisbon, N. D., be elected president to serve with the other present vice-presidents until October, 1910, and that the secretary be instructed to cast the unanimous ballot of the association for the following officers for the ensuing year, on the first Monday in October, 1910:

H. E. Murphy, of Manitowoc, Wis., president; Martin T. Roche, St. Paul, Minn., first vice-president; A. H. Laughlin, Lisbon, N. D., second vice-president; R. K. Hofoss, Aberdeen, S. D., third vice-president; C. K. Anderson, Owatonna, Minn., fourth vice-president; Jos. V. Godfrey, Moorhead, Minn., fifth vice-president; J. N. Hazen, treasurer; H. B. Smith, Minneapolis, secretary.

Exhibitors at Chicago Cement Show.

The Barrett Manufacturing Company has an attractive display of roofing, paving, waterproofing and insulating coal tar products in Booth No. 90. L. P. Sibley is in charge, assisted ably by B. M. Smith, W. E. Keach, H. B. Nichols, E. G. Wells and W. J. Walker.

N. J. Morehouse, western representative of the Coltrin concrete mixer, says that concrete on the West coast is the most popular building material used out that way. Coltrin mixers are having a great run in the West.

M. R. Evans, general manager of the Waterloo Cement Machinery Corporation, of Waterloo, Iowa, has at booth 203, in the annex of the Cement Show, its famous Polygon Concrete Mixer, known as the mixer that makes the money. A small model in the booth illustrates the Polygon principle of mixing. It attracted quite a crowd and was the center of attraction of the exhibit. Mr. Evans was in high spirits. He stated his business had increased 200 per cent last year, and he said it looked to him that this year's business would exceed that, from present indications.

D. Richter, of the Alpha Portland Cement Co., presides over the headquarters of the company in booth 24 at the Cement Show. He not only has had many inquiries, but is booking orders. He spoke of the outlook this year in the cement field as brighter than it ever had been. Dealers in cement in his territory, Western Ohio, Michigan, Indiana, Illinois, Minnesota and the Dakotas, all feel in high spirits and believed the consumption of cement in the farming districts will be something enormous the coming season. He said Alpha Portland cement bears a high reputation and will get its share of this great business which is certain to come.

The Atlas Portland Cement Company exhibit, in charge of P. Austin Tomes, is located just off the main aisle. This company is to be highly complimented for the beautiful exhibition. The booth is enclosed by a balustrade consisting of tracery, panels and pilasters, containing different color effects, all enclosing a space about 41'x10', floored with cement tile. At the ends of this space are Pompeian garden seats and sun-dials. The central feature of the exhibit is a figure of Atlas on a pedestal, denoting strength, standing in a niche with bas-relief, denoting art. On either side of Atlas is pilasters and columns supporting an entablature, and in panels under this are two basins receiving water from the heads of lions.

The gentlemen who will assist Mr. Tomes in doing the honors are: Walter Smith, J. D. Heck, C. H. Brigham, D. H. McFarland, John L. Cooper, W. E. Bailey, G. H. Lundy, M. H. Horn, Thos. M. Magiff, W. H. Heislatt, A. H. Scott, F. E. Potter, H. J. Staman, H. Van R. Palmer, John G. Evans, C. H. Brigham, I. W. Lewis, S. A. Putman and C. A. Kimball.

At booth 215-216 in the annex, the Sioux City Cement Machinery Co. have an exhibit of the McCracken double tile. A crowd of spectators have watched the boys making concrete tile with much interest. This machine was invented by W. J. McCracken and will make any size tile from 4" to 16" in diameter at the rate of from ten to twenty tiles per minute. One of the features is that two sizes of tile can be made at one time. As it has two tables, tile may be made on one while building blocks may be made on the other. Another feature is that the machine has no cams and runs just as smoothly at high speed as when running at low speed. Mr. McCracken is an experienced concrete man, as he and his brother have had a tile plant at Paulina, Ill., for a number of years.



Jumbo Plaster Co. Election.

RICHFIELD, UTAH, Feb. 16.—At the stockholders' meeting of the Jumbo Plaster & Cement Co. the new directors elected were: John C. Chidister, Richfield; Ferdinand Erickson, Mt. Pleasant; J. W. Johnson, Provo; Ezra Shoemaker, Manti; J. F. Tolton, Beaver; Judge Greenwood, Nephi; E. L. Clark, Parowan. These will meet on the 28th inst. to complete the organization of the board.

Will Elect New Quarters.

The Syracuse Wall Plaster Company, Syracuse, N. Y., has purchased the vacant property at Nos. 317 to 321 North Clinton street. Ground will be broken at once for a four-story building to cost about \$10,000, which will have the company's offices and salesroom on the first floor. The company has outgrown the present quarters in the Hier block at No. 320 North Clinton street.

American Gypsum Co.'s Meeting.

CLINTON, O., Feb. 18.—The stockholders and directors of the American Gypsum Company held their annual meeting here January 26. A muskrat banquet was given at the Island House in the evening. Twenty persons were in attendance, representing Chicago, Pittsburgh, Cleveland, Toledo and Port Clinton. The American Gypsum Company is erecting a new mill in connection with its other plant here. The new building will be a large one, with a foundation of 115 by 180 feet.

Officers were elected as follows: President, S. L. Avery; first vice president, S. V. Fulton; second vice president, C. G. Root; secretary, S. T. Meserve; treasurer, Emil Durr. A dividend of 1 1/4 per cent was declared and splendid showing was made of the increase of business and the accomplishments in reducing the cost of production.

New Artificial Building Stone.

FORT WAYNE, IND., Feb. 18.—After many years of experimenting the Menefees have invented what experts say is the finest artificial stone ever made. Its whiteness, its hardness and its non-absorbing qualities are claimed to be superior to any other block on the market.

The new artificial stone has as its ingredients white marble dust, white sand and white cement. These are blended in a scientific manner and are compressed and hardened until the substance resembles the finest marble. The hard faces of these blocks, it is said, can not be dented with a hammer, making them suitable for heavy construction work. The pieces do not absorb moisture and have clear, smooth surfaces that can not be distinguished from marble except by chemical analysis. One of the wonderful things about the block is that it can be exposed to the weather without affecting it. The blocks can be soaked in water without changing the color.

The Menefee company will make a specialty of porch columns, lawn vases and other new architectural features. Although the work on the new west end plant is practically at a standstill, the officers of the concern state that they hope to get into the building before spring. A considerable amount of the machinery for the plant has been shipped and will arrive within a few days.

The Pacific Coast Gypsum Company, Los Angeles, Cal., has been incorporated, with a capital of \$50,000. C. T. Crowell, E. N. Durant, C. L. Wright and A. S. C. Forbes are the incorporators.

The National Sheet Plaster Company, St. Louis, Mo., has been incorporated with a capital of \$100,000. Incorporators: Edward F. Carter, Wm. F. Kelly and Robt. T. Sullivan.

The American Gypsum Company, Ottawa, O., has increased its capital stock from \$150,000 to \$200,000.

The Spaulding Plaster Co. has been incorporated at Cincinnati, O., with a capital of \$25,000. J. D. Spaulding, Daisy D. Spaulding, W. H. Larrabee, Ellen E. Larrabee and W. S. Mitchell are the incorporators.

The Prior-Schuitstadt Co., Newark, N. J., has been incorporated for \$15,000 to conduct an ornamental plastering business. The incorporators are James V. Prior, Hugo G. Schuitstadt and Charles T. Schuitstadt.

SAND AND GRAVEL

New Company in Ohio.

COSHOCOTON, O., Feb. 18.—The Ohio and Pennsylvania Sand and Gravel Co., of Newcomerstown, has been incorporated by R. L. Shoemaker and others, for \$20,000. They will open big sand and gravel beds near that village this spring.

Wants Cement Bed Block Machinery.

FULTON, N. Y., Feb. 17.—Geo. F. Stackhouse, president of the Fred Pierce Sand Co., announces that his company is in the market for modern machinery for a cement bed block plant, it being the purpose to erect an up-to-date factory of this kind.

Modern Gravel Washing Plant.

BELLE FOURCHE, S. D., Feb. 16.—The contract for the concrete work of the United States Reclamation project at this place is being done by Hickey Brothers and A. F. Burke & Sons. The aggregate used in the concrete work is reclaimed by a plant that was put up for the purpose of washing and sizing the gravel. They are now installing a 500-yard modern gravel washing plant. The plans of this plant were prepared by the J. C. Buckbee Company, engineers, of Chicago.

Savage Sand Co., Incorporates.

BIRMINGHAM, ALA., Feb. 17.—With an authorized capital stock of \$10,000, the Savage Sand Co. has filed papers of incorporation in the probate court. The company will begin business with \$4,100 paid in. Main offices will be in Birmingham. The company will do a general sand and clay business. The officers are J. W. Savage, president; Edward Hiller, vice president and treasurer, and Thomas H. Sims, secretary and general manager.

Overhauling an Indiana Plant.

The Attica Sand & Gravel Company, Kickapoo, Ind., is having its plant overhauled and rearranged under the direction of Wm. Woodhall, Jr., who will have charge of its operation during the coming season. This is one of the best gravel deposits in that section of the country, and the output of the plant is only limited to the capacity of the equipment. There is always a splendid market for the goods. The company will wash and screen gravel and sand.

Holland Co. Elects Officers.

SCHENECTADY, N. Y., Feb. 17.—The certificate of the annual meeting of the Holland Sand Company, filed at the county clerk's office, shows that the following officers and directors have been elected for 1910: President, Henry Aldershot, and treasurer, Frank Anker. Both of the officers are directors, and the third member of the board is John Anker. The certificate also shows that the capital stock of the company is \$6,000, one-half of which has been paid in.

New Sand Company in Illinois.

OTTAWA, ILL., Feb. 17.—The Henders Brothers Sand Co. has turned out its first car of steel casting sand at its new plant a few miles west of this city. The organizers of the company are William A. Henders and Perry D. Henders and it will be their aim to dig nothing but the high grade sands abounding in such large quantities in the bluffs west of Ottawa. The senior member of the firm has long been identified with the Benson Brothers company. They have secured rights to mine on the John Duffey farm, situated midway between Ottawa and Utica. W. A. Henders will superintend and have actual charge of the work.

Platte Sand & Gravel Co., Denver, Col.; incorporated; capital, \$10,000; incorporators, Frank Atkins, Theodore C. Henry, Harry L. King.

Lorentz Sand Co., Alliance, O.; incorporated; capital, \$10,000; incorporators, Mary A. Lorentz and others.

Yohala Sand Co., Guthrie, Okla.; incorporated; capital, \$15,000; incorporators, W. S. Dills, T. J. Sidener, J. W. Shannon.

Thomas Sand & Gravel Co., Salt Lake City, Utah; incorporated; capital, \$10,000; incorporators, Albert Thomas, D. F. Doane, Fred Smith.

Sand and Gravel Shipments Increase.

ELGIN, ILL., Feb. 21.—With an increase of 2,500 tons in freight received during the last year and an increase in the output of the Torpedo Sand & Gravel Co.'s pits north of the city, the Chicago & Northwestern railroad anticipates that its freight business in Elgin during 1910 will eclipse all former years by several thousand tons.

During the coming summer, with increased facilities at the pits, railroad officials anticipate that Elgin's principal freight product will be sand and gravel from the Torpedo company's pits.

Illinois Sand Goes to Pittsburgh.

DIXON, ILL., Feb. 18.—The silica plant, located three miles west of Oregon, is now in full operation and a number of carloads of sand are being shipped daily to the company's plant near Pittsburgh, Pa., where it is used in making glass, sand paper, and for numerous other purposes. Electricity is the motive power used to run all the machinery. The Burlington railroad has put in a special spur, over which the sand is shipped. The buildings are of concrete and brick. The new industry is one of large importance, and the supply of sand rock, which, after quarrying, is crushed, ground and refined, is practically inexhaustible in that vicinity. The company now owns 23½ acres and has an option on many more acres adjoining.

Railway Buys Gravel Lands.

WAUKEGAN, ILL., Feb. 21.—The C. & N. W. railway has recently purchased a large addition to its gravel pits at Cary and is slowly transporting the immense hills of gravel and sand to Chicago.

Most of the land is owned by the C. & N. W. railroad, which bought one farm of 320 acres and another of 200 acres for the sand and gravel and rich soil. It bought whole groups of farm buildings, and in one instance last fall it took up a ten-acre corn field by the roots and dumped it into the Evanston track elevation. It drove a whole dairy herd out of a pasture in which it undermined a mountain of gravel and sand, tamping the material under steel rails in and out of Chicago. Thousands of acres of rich, black soil scrapped from the surface of the gravel deposits were spread over station grounds in three states.

Illinois Man Gets Big Job.

CAIRO, ILL., Feb. 21.—The Cairo Sand & Gravel Co. has received the resignation of its superintendent, Jean M. Allen, which was accepted—the resignation to take effect at once.

Mr. Allen, who has so ably handled the mechanical and engineering affairs of the company, has been called to the position of master mechanic of a company that is enlarging the Erie canal, a stupendous enterprise second only in this hemisphere to the Panama canal. It will take several years to complete the work. Mr. Allen will have supervision over 500 men employed in the company's big machine shops at Brewerton, N. Y., and an equipment of four large dredges, five steam shovels, three locomotives and cars, two drill boats, pile drivers, three tugs, eight motor boats, beside a large miscellaneous equipment of barges, etc.

The Cairo Sand & Gravel Co. regret Mr. Allen's resignation, but do not wish to prevent him accepting such an excellent offer.

Will Develop Fox River Material.

ELGIN, ILL., Feb. 19.—The Fox River Sand and Gravel Co. has nearly finished its test holes and will within a few days show its prospectus and open its books to those in Dundee and vicinity who care to take stock.

The company was organized last year with a capital stock of \$100,000, but has never issued any stock. Now it proposes to issue \$20,000 in stock and it is thought that this will almost pay for the building and equipment of an up-to-date gravel washer on the property, which is especially well located for the business.

The land to be used is the northeast part of the farm known as the Oatman farm, and is directly north of the Delos Dunton home. Prospect wells have been sunk in five different places on the land to a depth of from 20 to 40 feet, and in each one the material found has been the same. The last well sunk is now down 40 feet and will be continued 10 feet deeper.

From within a few feet of the top the entire hill seems to be a deposit of fine torpedo sand with no clay and very fine stones. A number of sand and gravel washer men have been out to examine the product and all pronounce it as being about the best in the vicinity of Chicago. The wells have been cased with plank as they were dug and the sand and gravel removed is in huge piles.



BRICK MEN ORGANIZE.

Form New Association Which Will Conduct a Vigorous Advertising Campaign to Promote Sales of Material.

PITTSBURG, PA., Feb. 18.—Conventions were held here the week of February 7-12 by the National Brick Manufacturers' Association, the American Ceramic Association, the National Paving Brick Manufacturers' Association, the Clay Products and the Face Brick Associations, the outcome of which was the formation of an entirely new organization, to be known as the Building Brick Association of America.

While the convention of the various bodies were held separately the members commingled freely, and as they were actuated by one common purpose, the formation of the new organization was a comparatively easy matter. Its purpose, as announced, is to secure cooperation between interests which have hitherto been in conflict.

At no previous time have the brick and clay products interests of this country been so generously represented. The attendance, while unusually large, was even more notable for its representative character, nearly every important firm in the United States having a member present.

The formation of the Building Brick Association does not mean that the underlying organizations are to surrender their identity—at least not right away. Evidence of this is given in the fact that they elected officers for the ensuing year. Those chosen by the National Brick Manufacturers' Association are:

President—S. E. Martin, Pittsburgh.

Vice President—R. L. Quessner, Cleveland.

Sec. and Treas.—J. P. B. Fiske, New York.

Retiring President Blair, of N. B. M. A., in his address chided the delegates for their lack of interest in the annual exhibits. He said that the brick manufacturers at their annual gathering were showing a few exhibits, which probably did not exceed \$500 in value, while in Chicago there was another meeting of the representatives of a competitive material (concrete), where is shown to the public exhibits of products valued at more than \$100,000. This shot went home, and the brick men were quite ready to receive with open arms the proposition for the new organization. The session was turned over to those interested in the promotion proposition, with R. G. Eisenhart, president of the Clay Products Association of America, as chairman, and J. Parker B. Fiske as secretary. The new constitution and by-laws were adopted unanimously, and the Building Brick Association of America became a fact.

It is proposed to advertise brick and clay products extensively in trade papers and magazines, to publish books for gratuitous distribution, showing what can be done with brick in erecting homes of moderate cost and conduct a competition with valuable cash prizes for the best designs to be used in these books, the general idea being to educate people in the use of brick. Field agents, or "missionaries," will also be put to work in various parts of the country. Committees were appointed as follows:

Executive Committee—S. C. Martin, Pittsburgh, Pa.; R. L. Quessner, Cleveland, Ohio; J. Parker B. Fiske, New York city; Ralph Simpkins, St. Louis, Mo.; F. W. Butterworth, Danville, Ill.

Membership Committee—J. C. Adams, Columbus, Ohio; E. J. Burke, Rochester, N. Y.; R. E. Sunderland, Omaha, Neb.

Twenty-one directors to serve for one, two and three years were also elected.

To Build Paving Brick Plant.

HUDSON, N. Y., Feb. 18.—A vitrified shale paving brick company is in process of organization with a capital stock of \$500,000, and on the Lasher farms of 205 acres and 17 acres, respectively, purchased recently in North Germantown, will erect shortly a large paving brick works, the first in Columbia county.

On the Ludlow farm, which has a large frontage on the Hudson river, and which was recently purchased by Eliash Lasher, is found an abundant supply of shale and clay suitable for the manufacture of paving brick. The sale of the two farms was made to C. T. Willard of the C. T. Willard Brick Co., of New York city. A spur will be built by the New York Central from its tracks to the brick plant.



BIG DEAL IN BRICK.

Wiebe Company to Remodel New York Granite Brick Co. Plant for its New Owners.

NEW YORK, Feb. 19.—John Heimlech and William H. H. Osborne, of Le Roy, N. Y., and their associates have purchased of the New York Granite Brick Co. its silicate brick plant located at South River, N. J., and are now organizing under the laws of New York the American Silicate Brick Co., which will have a capital stock of \$600,000, and a first mortgage 6 per cent 20-year gold bond issue of \$150,000.

This plant is one of the largest in the United States and cost, including its very limited period of operation, upwards of \$300,000. It is equipped with a 600 h. p. Corliss engine, a battery of 4-175 h. p. boilers, 6 Chisholm, Boyd & White presses, 6 hardening cylinders 6' diameter by 78' long, 3 tube mills 5' by 22' long, and other machinery and equipment. It also owns 44 acres of high-grade silica sand. It is located on the Raritan river, 23 miles from New York city, on a siding of the Raritan River railroad, thus having both rail and water transportation.

This plant was originally designed and its construction undertaken by the H. Huennekes Co., and was to have been operated under the division system, for Barclay Parsons, the engineer who built the Belmont tunnel, and his friends, but owing to a disagreement between the original promoters and the first contractors, a settlement was effected when the plant was only partly completed, and another party took the contract to complete the construction of this plant, and turn it over to the parties furnishing the capital, in a condition to make commercial silicate brick, which in a measure was accomplished.

After a very thorough investigation of the various brick plants throughout the country, and the various systems employed therein, the contract has finally been awarded to the Wiebe Engineering Co., New York, to remodel this plant to make it conform in every detail to the Wiebe-Hydro-Lime-Silicate-Process, and the latest modern designed machinery of this company will at once be installed, such as their new direct dryer, three hydro-vapor preparation machines, measuring devices and special rotating mixers.

When all of these alterations have been completed the plant will have a capacity of 100,000 brick for each ten hours' shift, and arrangements have been made with some of the principal builders in the city of New York to take the entire product of the plant. It will be operated under the management of John Heimlech, who has been a very successful operator of large stone quarries and lime kilns at Lime Rock, New York, three miles from Le Roy. Wm. H. H. Osborne, his partner, is a retired business man and banker, and has been for some years past operating a 200-acre farm at Le Roy for his own amusement.

Discuss Plant at Salt Lake.

SALT LAKE CITY, UTAH, Feb. 15.—A Chattanooga, Tenn., company has written to the manufacturers' association of Utah regarding the location of a sand-lime brick plant in Salt Lake. In his reply, among other things, Secretary Collett, of the association, said:

"Coming to the question of sand-lime brick, it is a question much talked of, but not much has been done as yet. I have before me samples of fire clay and silicon sands pronounced by experts to be of the very highest order. The sands are of fourteen colors, shades and tints and contain sufficient lime for cohesion. Brick made from the substance will stand the test of being thrown into cold water at a heat of 2,400 degrees. I know of one tract of land; in fact, the one from which these samples come, of 1,500 acres, only a few miles from the heart of this city and the railroad runs lengthwise through the tract. The land is for sale as the owners have no capital to promote the manufacturing industry. It would mean millions in a few years for any one who would take up the proposition. You may ask, 'Why does not local capital get busy in the premises?' The answer is that there are a thousand and one opportunities in nearly as many different directions. Only a few can be considered and these only superficially. Would like to hear from you further on this question."

REVIVES BRICK INDUSTRY.

Composite Product Known as El-Kus Likely to Put Milwaukee to the Front Again.

Milwaukee has long been famous for its brick. In fact, the city is called the Cream City, this appellation having been given it owing to the peculiar cream color of the brick made there and used in its residences and public buildings. The great growth of the city, however, and the rapid building up of the territory surrounding it, long ago exhausted this clay deposit, and it is necessary for the city to turn to some other line of building material.

The Wisconsin Composite Brick Company, organized not long ago to supply Milwaukee with sand-lime brick, bids fair to again make the city famous as a brick-producing center. El-kus brick, the trade mark title of the new product, is made of a patented composition of which sand is the base. Other ingredients are Portland cement, lime, certain chemicals, etc., the whole being combined by special machinery and processes into an adamantine stone which is said to equal, if it does not surpass, in strength and beauty of appearance, the most expensive face brick.

The new company completed its extensive plant in Milwaukee about the first of last October, and has been in active operation since. Lake sand is used. This is brought to the company's dock on Vogel's Island by dredge, and fed into a direct heat rotary dryer, whence it is elevated and screened into a storage bin. Adjoining bins contain the other ingredients used, and these are fed by a special proportioning machine into a Smith tube-mill. Moistening with a differential screw mixer admits of a silk-like texture for the material. Two four-mold Model C presses are used, a patented chemical solution being added just before pressing. The brick are cooked with steam under great pressure, in two steel cylinders, a feature being the tanks on top, wherein a gas is generated and passed over the bricks.

The power plant is of local manufacture and includes two 125-horsepower tubular boilers and a Filer & Stowell heavy duty Corliss engine. All the rest of the equipment, including several special machines, constructed under the direction of the manager and inventor, Laurence Elkus, was supplied by the American Clay Machinery Company, of Willoughby, O. This company also prepared the plans under Mr. Elkus' direction and supervised the installation.

There are eight patents owned by Mr. Elkus, covering machinery and processes used in the manufacture of El-kus brick, and the Wisconsin Composite Brick Company has exclusive rights for Wisconsin and Illinois.

Tests made at the University of Wisconsin show an average crushing strength of 7,630 pounds per square inch, and a modulus of rupture or transverse strength of 1,170, which is 150 percent greater than New York city requirements.

El-kus brick has a smooth glaze-like finish. It has a panel with the trade mark El-kus as an indent on every brick. It has been received with instant favor by architects and builders, and is now being used for veneering several important buildings, including a theater and apartment house.

KENTUCKY BRICK.

Winchester Company Crowded with Orders and Compelled to Make Enlargements at its Plant.

WINCHESTER, KY., Feb. 15.—J. Harry Allan, secretary and treasurer of the Winchester Granite Brick Co., which makes a specialty of sand-lime brick, is naturally, and very excusably, proud of the company's plant and increasing business. When asked about them he said:

"I am glad to report that our factory has been running on full time, making 19,000 brick a day and shipping out just as fast as we could make them. We have some buildings that are creditable, and more coming. Last year we erected a lime-kiln of 75 barrels daily capacity, and we are burning lime for our own use as well as some for the market. The lime-kiln is within 100 feet of the factory and the limestone less than 200 feet from the kiln, but the distance is rather too perpendicular to be very safe. A little back from the limestone comes the sand that we make brick of and also that which we ship. We have been shipping from 50 to 75 cars of sand and gravel per month and it keeps us hustling to keep out of the way of the orders. We have put in an American pulverizer that does the work admirably and have erected a sand-bin that will hold about 10 cars of sand. We screen the sand to 1-8 or a 1-4 for the trade when wanted, otherwise it goes to them just as it



PLANT OF THE WISCONSIN COMPOSITE BRICK COMPANY, MILWAUKEE, WIS.

comes from the pulverizer, and in this shape I am inclined to believe that it is the best concrete sand in the world.

"There is one thing that I should like to see done and that is some method perfected by which the sand-lime people can make a red brick. We have a great demand for a red brick but the best that we can do is to make a pink, and it is quite embarrassing to us to have to be turned down because we cannot make a red."

The new building for the Y. M. C. A. at Covington, Ky., is faced with white brick from the Winchester Co.'s plant, and makes a handsome appearance, so it is evident Mr. Allan has ample reason for feeling proud of his product even if he can't turn out the desired shade of red.

Merger of Nebraska Companies.

FREMONT, NEB., Feb. 18.—A decision has been reached by the shareholders of the Fremont Granite Brick Co. and the Fremont Cement Products Co. to consolidate the two corporations. Instructions were issued to form the merger at once.

The companies, both operating factories here and in close proximity to each other, have been working along the same lines and it is assumed that the management of the two can be as well carried forward, economically and successfully, as to operate independently. The brick company has an authorized capital of \$100,000 with a paid up capital of \$22,750. The cement company has a paid up capital of \$18,000.

Intend to Erect Brick Plant.

BOSTON, MASS., Feb. 18.—The Winchester Rock & Brick Co., the operations of which have been delayed by various causes, has begun to install machinery for rock crushing, and expects to soon start the erection of a sand-lime brick plant. In this connection Secretary James H. Shedd says:

"We have some of the finest sand in the country for this line. A recent test of our sand showed that it stood 2,400 degrees of heat."



HARDENING CYLINDERS IN PLANT OF THE WISCONSIN COMPOSITE BRICK COMPANY, MILWAUKEE, WIS.

LIME MEETING.

Very Successful Convention of the National Lime Manufacturers' Association Held at Pittsburgh.]

The eighth annual meeting of the National Lime Manufacturers' Association was held January 26 and 27, at the Ft. Pitt Hotel, Pittsburgh, Pa. There was the usual good attendance and interesting meeting of this society which has done so much for the building up of the lime industry of the United States. During the proceedings there was provided an afternoon for the purpose of visiting the laboratories of the United States Geological Survey in a body. This is devoted to the testing and classifying of structural materials of all kinds. Deep interest was taken in this feature of the meeting by all of the members, and as this is one of the things that has been brought about by the association it is considered to be an achievement worthy of all of the effort and expense that has been devoted to the association work.

Many familiar faces were missing, but the renewed interest in the work of the association was apparent to every one present.

A sketch of the proceedings in detail follows:

MORNING SESSION, JANUARY 26.

Our gallant leader, President Wm. E. Carson, called the meeting to order with a resounding thump of the gavel and suggested that the reading of the minutes be dispensed with, as the same had been issued to all of the members in pamphlet form and was familiar to every one present.

A nominating committee was appointed, consisting of J. King McClannahan, Jr., Frank P. Hunkins and Luther Keller, with instructions to make up a slate of their selections for the officers of the coming year and to present the same at a later period in the proceedings.

The Standardization Committee presented its report through the chairman, Walter S. Sheldon, who stated that the committee, consisting of himself and Messrs. Warner and Healy, had met in Boston; and, with the co-operation of the directors of the agricultural experiment stations, had reached a classification of lime for agricultural purposes which had been exhibited in the printed report already in the hands of the members. This report has been sent to the directors of all of the agricultural experiment stations east of the Mississippi River, and the committee is now sending out more.

Prof. Wheeler, of the Rhode Island station, had stated to Mr. Sheldon that the work of this committee had been of practical help to him. Nearly all of the members joined in a brief discussion of this important subject, and the report was ordered accepted and filed.

The reports of several other special committees which have been at work since the last annual meeting were received and briefly discussed in the manner of a review, for all of these reports had been brought to the attention of the members previously.

The Glossary Committee reported through its chairman, Irving Warner, with a typewritten report containing a long list of words with their definitions, amounting to a comprehensive dictionary of the technical terms used in the lime industry. The work showed that the committee, consisting of Mr. Warner and Dr. E. W. Lazell, had given a great deal of work to their report, and they invited the membership to discuss the matter.

The president suggested that it would be well to have the United States Geological Survey to use this glossary after it was accepted, and further discussion was suspended as it was clearly evident it would take up nearly all of the time of the meeting if allowed to proceed.

The glossary was referred back to the committee with instructions to work further so as to get the matter complete.

Dr. Lazell requested that the members take copies of the typewritten glossary and send written criticisms to the committee so that they could get the various local names for the parts of the kilns, as well as the names for the different types of kilns, and through their criticism to assist in what is really a very difficult task.

The Committee on Government Co-operation reported through President Carson, as chairman, that they had been successful in getting a small appropriation so that the laboratories of the Geological Survey could begin the work on the lime industry. Mr. Emley, he reported, had visited a number of the plants and he suggested that each and every one of

the members should communicate with their senator and with their congressman immediately in a petition to have the government establish a Bureau of Mines in which the lime industry would be represented. This was accordingly done and a very large number of telegrams were sent to Washington.

Charles Weiler was called on to resume his classical subject of the United States Lime Corporation. Mr. Weiler had written a literary gem which is characteristic of the reports that he always makes. It bristled with wit, and besides with good sound business arguments. He said that there were fifty-seven varieties of reasons why such a plan should be worked out as opposed to 43 per cent of reasons in the shape of difficulties in the way. Mr. Weiler's paper was really a very brilliant effort, and made such a pronounced impression that the president continued him as a committee of one to labor further upon that topic.

President Carson suggested that a strong resolution to the Senate of the United States, requesting the immediate passage of the bill which has already been passed by the House, should be sent from the meeting. Messrs. Cobb and Chas. Warner were appointed on the committee and this was accordingly done. A letter from Pittsburgh from each member to his own senator was the result of this suggestion.

Col. Cobb wanted to know clearly what was the object of the Bureau of Mines.

President Carson explained: "We are not in a position to push the lime industry until we have a whole lot of standardization work completed so that

There was some little discussion as to the disposal of the book and the matter was finally left to a later time.

Col. Cobb, in his capacity as treasurer, then reported the financial affairs of the association and made an earnest appeal to the members to pay up their dues, which was complied with alacrity.

Chas. Warner moved that when this meeting adjourned that the members form in a body immediately after luncheon and go to the laboratories of the Geological Survey to observe the demonstration of what is being done in the interests of the industry. Mr. Emley explained how the arsenal could be reached by the street cars.

President Carson read a paper on the subject of kilns that had been prepared by Mr. Gauthrop, in which he discussed all of the various types of kilns and their practical and technical differences. Such matters as the relation of labor to economy, and an exhaustive comparison of the large and small kilns, and citing from his own experience, he said he felt that a large kiln cannot be depended on to produce so uniformly as smaller ones, and on the whole he favors the smaller type of kiln.

Irving Warner responded to this by saying that they were working out a large kiln and found a great many features that at first were not expected, but that it looks now very encouraging. Generally speaking, the little kiln is the best where a small output is sufficient. Every good plant ought to have three units or divisions. The difference that he noted was that big kilns must be kept in commission constantly.

President Carson remarked that it cost much more to keep up the lining in large kilns than in the equal capacity when expressed in smaller kilns.

Irving Warner replied that he found that the cost of lining was the same in every type of kiln if they were of equal construction and an equal area at the burning zone.

Here followed quite a discussion on the subject of the lining of kilns, and different materials for lining them. This subject always leads to a discussion of fuel, and the influence of heat produced by different fuels in the calcining zone.

Mr. Ekstrand said that he had watched the experiments that had been conducted by others in large kilns, but that he felt that small kilns were more flexible and worked out better in practice. He said that the cost per ton of lime produced is a primary factor. In the matter of repairs small kilns are better because it does not cut off such a great tonnage when a kiln is down. The cost of operation is the only chance for the large kiln. He considers that flexibility is almost as desirable from the viewpoint of economy as a considerable increase in the output.

Further discussion *pro* and *con* ensued on the subject of kilns and practical firing with the relative economies.

The meeting then adjourned to visit the laboratory of the Geological Survey after luncheon.



W. E. CARSON, RIVERTON, VA., PRESIDENT.

we can get after new uses and compete more favorably in the market with other products. Practically nothing is known, at least there is no literature on the subject that is based on good authority. We had Mr. Emley sent out to do the pioneering work, and he has hardly had the opportunity of opening up the subject as yet, it being one of such vast proportions. This small appropriation in the hands of the Geological Survey is in danger of being cut off any time, while the establishment of a Bureau of Mines would be a permanent institution and would assure the continuance of this kind of expert work."

Mr. Weiler: "I would like to know what the members have received in reply to the letters they have sent to their senators?"

In reply to this query, quite a number of members arose and stated that they had received favorable replies from the senators who had been addressed in the matter.

A vote of thanks was extended to President Carson for his very satisfactory and successful work as the chairman of the Committee on Government Co-operation.

Chas. Warner, resuming, said: "Another bouquet is due to Mr. Carson for his work in compiling the proceedings of the meetings of this association since its foundation, and the binding of the same into one volume entitled 'Lime Light,' copies of which can be secured by the members." He felt that as this was compiled for the use of the members that it ought to be reserved for the membership, and, although he explained that the book was published at the personal expense of the president, that if any deficit remained after the members had all secured a copy, that the association should reimburse him.

AT THE ARSENAL LABORATORY.

After luncheon the members of the association met in the lobby of the hotel and boarded the street cars which carried them to the historic Pittsburg Arsenal, which was established in 1814, when the city was considered more or less of an outpost of the then infant American Republic.

The arsenal has recently been converted into a laboratory for the testing of building materials, such as clay, concrete, cement, etc. The technical gentlemen in charge of the laboratory were very kind in receiving the members and conducted them to a lecture room, where by counting those present it was found that President Carson was not on hand.

Walter S. Sheldon, by acclamation, was nominated for temporary chairman, and he called the meeting to order by explaining that the association, by invitation of the management of the laboratories, would be shown an outline of the work now in hand by the government experts.

President Carson appeared about this time, and J. C. Roberts, engineer in charge of the laboratory, in a neat little speech, presented our president with a huge key which indicated that the whole works were now in the hands of the visitors.

Mr. Carson promptly pocketed the key and acknowledged the trust that had been conferred upon him, and asked Mr. Sheldon to acknowledge the cordiality expressed, which he did in a neat little speech.

Prof. A. V. Blininger, the eminent clay expert, reviewed the basic observations and arrangements on which the work of the laboratories has been organized, and explained that it was necessary, in taking up the subject of the study of lime, to provide testing machines before any great progress could be made, as apparatus that was useful in the clay in-

dustry was found to be inapplicable to the study of lime. He told of the great need of a larger appropriation to carry on the investigations to a point where practical benefit to the lime manufacturers could be derived. The insignificance of the appropriation was strongly illustrated by the vast amount of preliminary work which had been accomplished with so little encouragement in a financial way.

H. H. Clark, electrical engineer, described an electric machine which he has contrived for the testing of the viscosity of lime and clay pastes. He showed by a number of diagrams the comparisons of results which he had obtained from his machine. This machine has been in service for two weeks and it was found that it was impossible to make very much headway without larger expenditure than the appropriation permitted.

Mr. Emley explained that the German method of testing and comparing lime had first been adopted, but that the present investigations would be conducted upon a broader and more exact basis than that in use by the German government.

J. K. Clement, chemical engineer, gave an interesting talk on the history of lime burning, as recorded by various technical authorities in Germany and France.

Mr. Emley was again called on to discuss his study of the subject of density and porosity of the different stones that are used in lime burning, as found in his recent travels.

H. C. Ashley, chemical engineer, exhibited the results of his experiments with coloring matter to test the plasticity of lime. He has had great success in this direction in the clay industry and says that he has not as yet been able to find a satisfactory dye that will determine the plasticity of lime. He exhibited a number of unsatisfactory tubes which showed the varying results of these experiments.

At this point, Mr. Carson returned the key to Prof. Blininger, but it had shrunken to very insignificant proportions as compared to the time at which he received it.

D. S. Hunkins wanted to know if that indicated merely a chemical change, and W. H. Boston allowed that it did.

The members were then invited by the staff of the laboratory to view the various parts of the equipment and examine the same. The members spent the entire afternoon in interested observation of the work which has been at last secured by the Technical Committee of the association, as a part of the government inquiry into the comparative merits of lime as a building material.

Mr. Ekstrand on Barrels.

An evening session was held in which Chas. Ekstrand, of the Palmer Lime Company of York, Pa., gave an illustrated lecture on the subject of cooperation. The views were all taken in the great cooper shops of the Brooklyn Cooperage Company, where practically everything is done by machinery and every known device of economy and convenience is used. Mr. Ekstrand patiently answered all questions and explained the making of the barrel fully from the tree to the delivered, finished package. It was a very entertaining lecture, and every member of the association felt well repaid for the time devoted to it.

MORNING SESSION, JANUARY 27.

With his customary enthusiasm, President Carson called the meeting to order, and, after calling the roll of the various committees which were to report and disposing of these details, he called upon J. E. Burchard, of the United States Geological Survey, to talk upon his subject of "The Elements of Geology as Applied to Limestone Quarrying." This talk was very comprehensive and instructive. Mr. Burchard began with the geological legend of the lime rocks that are familiar to the manufacturer of lime, and described the conditions of the formation of the rock itself as bearing upon its present use as a means of producing lime. His talk amounted to a lecture on applied geology as preliminary to the study of the lime industry from a technical standpoint. It was extremely valuable to every man present.

A. P. Broomell, kiln expert, of York, Pa., read a paper on the subject of the modern kiln, which is here given in full.

THE MODERN KILN.

By A. P. BROOMEELL.

Only a short time ago, measured as the years now go by, the modern, self-supporting, outside fired steel shell lime kiln as we have it today was a thing unknown.

Lime manufacturers were content to plod along in the good old way, using the same style, and in many

instances the very same kiln in which their fathers and their grandfathers had burned lime before them.

Lime kilns were not manufactured in these easy going, non-competitive days. They were simply built on the spot by digging a hole in the side of the hill and lining it with some refractory material.

And those of you who have examined these old time kilns will remember that the mason work was of a quality rarely equaled today.

All things, however, come to an end some time, and so the Rip Van Winkle slumber of the old time lime burners was at last broken, and, looking around as they rubbed their still sleepy eyes, they saw miles and miles ahead of them a mighty procession marching rapidly along to the music of the biggest band they had ever seen.

The leader of the band was "Progress." The bass drum was pounded by "Modern Methods," while the other players were "New Ideas," "Careful Management," "Economy," "Close Figuring," "Efficient Help" and every other thing that goes to make up the busy, rushing, calculating business world of today.

But while the band was leading the procession, stalking behind all was something our drowsy friends had never seen nor ever dreamed of.

Its brilliant uniform was water-proof and fire-proof. Its head was high in the air. Its chin was up. Its legs were long and strong and its march was rapid.

In its hard bony hand was held a long, wicked looking whip with which the laggards were continually and unmercifully lashed.

Across the forehead of this great, ugly, never sleeping, irresistible, merciless giant, this driver of men, was printed in big letters of fire this one word "Competition."

Immediately following the awakening there sprung up a loud and continuous demand for something better, and, as in all other things, where there is a demand there is always somebody ready, willing and able to supply what is required.

Hence the modern lime kiln, which, while not yet perfect, is making rapid strides toward that happy condition.

The ideal kiln for burning lime rock is one which will turn out the greatest amount of perfectly burned lime at a minimum cost of fuel, attendance and repairs.

The modern kiln is self supporting. The base is so arranged that the cooler, which must be most substan-

of the cooling cone is something prodigious, and our jumbo becomes a real and unruly elephant.

In determining the diameter, height and general style of a kiln, it is very necessary to take into consideration the nature and quality of rock, kind of fuel and general conditions.

It is usually safe to say that for a grade of rock which comes from the kiln in good sized lumps—practically the same size as the rock when charged—a kiln of rather large diameter and good height is preferable.

When, however, the rock as it is being burned crumbles badly and comes from the cooler in the shape of coarse sand, a kiln of small diameter and less in height will give the best results.

A long experience in the building of lime kilns has led to the adoption of a kiln of from six to six and one-half feet diameter inside of the lining as being the best, all things considered.

Such a kiln should have two furnaces, each about 36" to 42" wide and long enough to take in 4-foot cordwood.

The barrel of the kiln at the eyes should be drawn in or flattened, which will enable the fire to reach the center, thus preventing core, and will also facilitate the turning of a good, substantial arch over the eyes of the kiln.

The total height should be 40' to 50'. The fire brick lining should gradually be changed in shape above the furnaces until at a point about 15' above the grate bars the lining will be round inside. From this point upward the inside diameter should be gradually increased until at the top it is about 7' or even 8' inside.

When turning the arches over the furnaces, which should have a radius of about half the width of the furnace, as well as in all other fire brick work, great care should be taken to have the brick laid with the least possible amount of fire clay.

A very good way to lay fire brick is to put them in position without using any fire clay, and then fill all cracks by pouring in very thin fire clay mortar.

The best grate bar for bituminous coal is one having about 50% of air opening.

When the total length of furnace is say 60" the grates should be made in two lengths and supported on heavy cast iron cross bars.

The back set of bars should be made in the usual way with air space running full length.

The front section of grates should be made with air space only one-half of their length. The other half, that next to the fire door, should be blank or arranged with pockets and filled in with fire brick.

The object of this is to get a wide dead plate or coking space. Furnaces having grate bars of this type will burn more lime per pound than when the air space runs the full length.

If when firing such a furnace, the green coal is piled high on the dead space and pushed back only after it has become well coked, the result will be a good, hot and practically smokeless fire all the time.

Less coal will be required, much less green coal will find its way into the ash pot, it will be easier on the fireman and the owner will not be so likely to be prosecuted for the smoke nuisance.

While we are speaking about firing kilns it might be well to mention a few points which many operators apparently overlook.

The cost of fuel is one of the principal items of expense. Why not save as much as possible?

When employing firemen would it not perhaps be wise if necessary to pay a little higher wages and get the benefit of some brains? Muscle is necessary, but it is not the only essential if the best result both as to output and cost is to be obtained.

Go to the average battery of kilns and talk to the firemen. Watch him work. Note the green coal in the ash pit and the great clouds of black smoke (unburned coal) pouring out at the top of the kilns.

Watch the ash heap and note the unburned coal it contains. Look at the pile of scrap and count the burned out grate bars. Be particular to notice that the ash pit door is wide open, delivering such an excess of air under the grates that the flame is forced out at the front of the furnace all around the fire door.

When you have taken note of all of these bad things and many more that you can readily see, and which can be avoided by intelligent firing, you will certainly conclude that while you are saving on your pay roll you are wasting a lot of good money in other ways.

It is impossible to get satisfactory results from the kind of firemen many lime burners employ.

There are other things besides incompetent firemen. When owners insist and persist in using the very lowest grade of coal that can be bought they must shoulder a good proportion of responsibility for poor results.

No fireman can successfully burn sand or slate.

The cost of handling and freight charges on a ton of coal containing say only 11,000 heat units and as high as 20% of ash is just as much as on coal containing 14,000 heat units and only 8 to 12% of ash.

Unfortunately a great many lime manufacturers do not keep any very careful record of costs. They can usually figure out at the end of the year the total amount of profits or losses, but few can tell in detail just how his money is made or where it is lost.

Careful records taken of every item of expense, if tabulated and studied, will certainly show where and when the profit might be increased or the losses decreased, and the lash of competition might not cut so deep.

This paper naturally brought forth some discussion and Mr. Broomell related his experience with the construction of the reinforced concrete kiln, which, by the way, he has made quite a success. Whenever the subject of "kiln" is sprung, all of the members join in the discussion and have something to say, and this occasion was not exceptional in this regard.

Messrs. Stevens and Ekstrand discussed the use of concrete when plastered on the inside of the kiln, and both were of the opinion that it can be used to advantage in this way.

Mr. Keller, of the Nominating Committee, reported the following slate, which was unanimously elected:

W. E. Carson, president; Chas. Weiler, first vice president; Walter S. Sheldon, second vice president; Geo. J. Nicholson, third vice president; C. W. S. Cobb, treasurer, and ROCK PRODUCTS, secretary. The Executive Committee are W. E. Carson, J. King McClannahan, Jr., and Chas. Warner.

Robt. S. Edwards, chemical engineer, read a paper



C. W. S. COBB, ST. LOUIS, TREASURER.

ROCK PRODUCTS

entitled "The Manufacture of Lime—Some Comparisons Between Methods East and West." Mr. Edwards has traveled extensively and built kilns in Texas and California, as well as in New England and other places. He compared the variation of conditions of the different kinds of fuels, and reviewed the matter of hydration as he had observed it, and the resulting studies upon various localities. The paper was well received.

H. E. Bachtenkircker read a paper entitled "The Hydration Problem to Date." Mr. Bachtenkircker advocates the continuous process, and stated that a temperature of 190° Fahr. in slacking lime is the limit for producing a good hydrate. The paper was in fact a continuation of Mr. Bachtenkircker's studies on this important subject.

W. E. Emley, of the United States Geological Survey, read a paper entitled "The Result of Some Lime Investigations, Lime Kiln Designs and Methods of Creating Draft," which were the result of his tour of observation and studies growing out of the same. Mr. Emley has the hearty endorsement of the members of the association in all of his work, and his paper was received with the warmest approval.

Prof. E. O. Fippin, of the Department of Soil Technology of Cornell University, read a paper entitled "The Relation of Lime to Soil Improvements." This is the greatest document that has yet been produced on the subject of liming soils, in the practical intelligence which it derives from comprehensive and completed research. He divided his subject carefully into topics so as to cover the whole subject. He said that calcium helps to make starch. The potash and phosphorous acid in the soil are affected by lime, and in that way of very important influence. The productive power of the soil is governed by the control of water, lime, the amount of humus, tillage, and last of all the application of fertilizer. The largest amount of lime in the finest state of division is most to be desired where lime is applied to the soil. He recommended at least 75 per cent through a 100 mesh screen, with a high proportion of calcium. Clay soils need lime more than sandy soils as a general rule. The relation of lime to nitrogen is very close. Frequently there are physical difficulties in the way of the use of lime. He asked for the co-operation of the manufacturers to produce the kind of package, the kind of lime wanted, and stated that the growth of the use of lime for agricultural purposes would be enormous if the trade in this direction was properly served.

Mr. Stevens remarked that this was the best paper ever read before the association and suggested that the paper be prepared in pamphlet form for the use of the membership.

AFTERNOON SESSION, JANUARY 29.

Promptly with the resumption of business the president called for discussion of Prof. Fippin's paper. Mr. Stevens remarked: "I do not know anything so generally useful as to have this paper read by the intelligent farmer. I believe that it would be well to have a large number of them printed, and let the members supply themselves with all that they want for distribution." This seemed to be the prevailing opinion, and it was accordingly ordered that the paper be prepared in pamphlet form in this way.

E. Schmatolla, the great German expert in the application of producer gas for burning lime, delivered a lecture on the subject of his experience in building lime plants in foreign countries. After the meeting he wrote his talk out so that we are able to present it to our readers in another place in full.

Among those in attendance were:

- W. E. Carson, Riverton Lime Co., Riverton, Va.
- Fred K. Irvine, Rock Products, Chicago.
- W. L. Heise, Rheems, Pa.
- Walter S. Sheldon, New Jersey Lime Co., Hamburg, N. J.
- John P. Lynch, New Jersey Lime Co., Hamburg, N. J.
- J. King McCleannahan, Jr., Blair Limestone Co., Hollidaysburg, Pa.
- Charles H. Claiborne, Union Mining Co., Baltimore, Md.
- F. C. Lauer, Rochester Lime Co., Rochester, N. Y.
- George W. Lauer, Rochester Lime Co., Rochester, N. Y.
- Charles Warner, Charles Warner Co., Wilmington, Del.
- W. E. Emley, U. S. Geological Survey, Pittsburgh, Pa.
- Charles Ekstrand, Lowell M. Palmer, York, Pa.
- H. W. Smith, Charles Warner Co., Wilmington, Del.
- W. H. Roberts, Climax Lime & Stone Co., Wick, Pa.
- Theo. Fleischer, Sheboygan Lime Co., Sheboygan, Wis.
- E. W. Lazell, Charles Warner Co., Wilmington, Del.
- W. H. Bradley, Duff Patents Co., Pittsburgh, Pa.
- C. M. Lauritzen, Raymond Brothers Impact Pulverizer Co., Chicago, Ill.
- H. E. Bachtenkircker, Doles & Shepard Co., Chicago, Ill.
- A. H. Lauman, National Mortar & Supply Co., Pittsburgh, Pa.
- G. J. Nicolson, White Marble Lime Co., Manistique, Mich.
- Luther Keller, Scranton, Pa.
- George Edline, Apollo Lime & Ballast Co., Apollo, Pa.
- A. P. Broome, York, Pa.
- E. T. Burchard, U. S. Geological Survey, Washington, D. C.

Morris Hunter, Edison Portland Cement Co., Pittsburgh, Pa.

- A. V. Blininger, U. S. Geological Survey, Pittsburgh, Pa.
- T. K. Morris, A. G. Morris & Son, Pittsburgh, Pa.
- William Schrader, Johnstown, Pa.
- J. C. Adams, D. J. Kennedy Co., Pittsburgh, Pa.
- James W. Wardrop, National Builders' Supply Association, Pittsburgh, Pa.
- D. J. Kennedy, D. J. Kennedy Co., Pittsburgh, Pa.
- George H. Heppenstall, Heppenstall & Marquis, Pittsburgh, Pa.
- W. A. McCall, *Dealers Record*, Chicago, Ill.
- W. H. Barton, Ash Grove Lime & Portland Cement Co., Ash Grove, Mo.
- C. C. Kritzer, The Kritzer Co., Chicago, Ill.
- H. A. Gowthrop, Marlton Lime & Stone Co., Morris town, Pa.
- Frank Crudder, Riverton Lime Co., Riverton, Va.
- Charles C. Cox, Cox Lime & Stone Co., Plymouth Meeting, Pa.
- William B. Irvine, Knickerbocker Lime Co., Philadelphia, Pa.
- H. A. Buffum, Rockland-Rockport Lime Co., Rockland, Me.
- N. W. Hardenbergh, Connecticut Lime Co., Canaan, Conn.
- Charles Weiler, Western Lime & Cement Co., Milwaukee, Wis.
- C. W. S. Cobb, Glencoe Lime & Cement Co., St. Louis, Mo.
- Phil Daurenheim, Glencoe Lime & Cement Co., St. Louis, Mo.
- George B. Cock, official stenographer, Philadelphia, Pa.
- E. Schmatola, consulting engineer, New York City.
- L. P. Dillon, E. Dillon Sons, Indian Rock, Va.
- J. J. Urschell, Woodville Lime & Portland Cement Co., Toledo, Ohio.
- G. H. Falst, Woodville Lime & Portland Cement Co., Toledo, Ohio.
- W. H. Price, Urschell Bates, Toledo, O.
- E. Dillon, E. Dillon Sons, Indian Rock, Va.
- George B. Catlin, Bowling Green, Vt.
- A. M. Glasgow, Tennessee Marble Lime Co., Knoxville, Tenn.
- R. S. Edwards, Boston, Mass.
- F. P. Hunkins, Hunkins-Willis Lime & Cement Co., St. Louis, Mo.
- D. S. Hunkins, Peerless White Lime Co., St. Genevieve, Mo.
- Irving Warner, Charles Warner Co., Wilmington, Del.
- E. O. Fippin, Cornell University, Ithaca, N. Y.
- A. P. Freeman, Connecticut Lime Co., Canaan, Conn.
- J. MacLaughlin, Thomaston Stone & Lime Co., Thomaston, Pa.
- A. A. Stevens, American Stone & Lime Co., Tyrone, Pa.
- Lowell M. Palmer, Jr., Lowell M. Palmer, New York City.

PRODUCER-GASFIRED LIME PLANTS.

Based on a Lecture Delivered Before the National Lime Manufacturers' Association, in Pittsburgh, January 29, 1910.

BY E. SCHMATOLLA, CHEMICAL ENGINEER OF NEW YORK.

I started to build and operate Producer gas-fired shaft kilns for burning lime, dolomite, magnesite and similar rock products in the year 1896 in Berlin. I frankly admit that I was not the first who tried to burn lime with producer gas. As far as I know, the first producer gas-fired lime kiln was built in Bohemia in the year 1864. Other producer gas-fired kilns were built later, but I very often heard in the lime plants that producer gasfiring has been a failure.

However, from my former experience in steel works and metallurgical plants, where producer gasfiring was already highly developed, I was convinced that producer gasfiring could be correctly adapted to lime burning, and that it would govern the future also in the lime industry. It has taken me years of hard work to get a few gas kilns built in Germany and other countries of Europe, and to overcome little by little the great prejudices which I found firmly established among the lime burners. About the year 1906, I had already erected and reconstructed more than thirty of such kilns.

Everyone here is familiar with the photographs of the plants which have been described in detail in my several pamphlets, and a copy of which I will be glad to furnish any who may ask for them. My work in this line has been signally successful and entirely satisfactory to the owners of the several plants, for the reason that gasfiring has introduced economics which have amounted to a profit in every case.

In the year 1908 the leading German journal wrote about the Schmatola gas-fired lime kiln as follows:

"Attempts have been made for many years past to burn lime with the aid of producer gas instead of solid fuel, but progress has always been very slow, and it is only during the last few years that the matter has been more carefully studied and made a commercial success."

"Amongst the kiln builders who have been chiefly responsible for the progress of the lime-burning industry, no one has been more successful than Mr. Ernst Schmatola, whose work has succeeded beyond all expectations in the adaptation and construction of gas producers and kilns for the lime-burning industry. Quite recently we examined one of these kilns in Mr. Franz Oertel's lime works in Zossen, and saw it in regular work. The gas produced is passed into three vertical flues, each of which is connected with two openings leading to the inside of the kiln, this arrangement securing an even distribution

of the gas through the kiln. The air necessary for the combustion of the gas is admitted through regulated openings in the three doors of the kiln from which the burnt lime is removed. This passing through the finished lime becomes heated and ignites the gas with great readiness. A supply of air is also admitted between the lining and outer wall of the kiln, where it also becomes heated and enters the kiln nearer the top. This secondary air supply assists in keeping the lining cool and increases its durability, but its main purpose is to finish the combustion by igniting any small quantity of gas previously remaining unburned. The temperature of the kiln was even throughout, and can be regulated in all the different parts with accuracy. The lime produced was completely burned, and in large lumps, a very small proportion of "smalls" being formed. The latter was removed through a separate opening, and thus automatically separated from the lumps. The kiln has a daily output of 15 tons, and a weekly output of 107 tons is a fair average of many weeks' working. The analysis of the waste gases is interesting. The sample was taken from the feed opening and consisted of:

Carbon dioxide.....	34.5 per cent
Carbon monoxide.....	0.6 per cent
Oxygen	0.4 per cent
Nitrogen64.5 per cent

"This analysis shows that the combustion in this Schmatola gas kiln is remarkably complete, and that the firing is carried out with a very small excess of air. This last is of great importance in preventing a waste of fuel."

"This particular kiln has been in regular use now for more than three years with perfect satisfaction to its owners, and it is quite clear that the problem of economical firing of lime kilns has been solved by Mr. Schmatola."

Of course I also had to get experience and to improve the design from year to year. You know probably that high-grade coal is very scarce and expensive in many countries of Europe, and that they are compelled to use low-grade fuels, as, for example, peat, lignite, and brown-coal, which are all very different from each other and vary in the different deposits. Therefore, I had to adapt the kiln and to instruct the operators not only with regard to a different quality for a limestone, but also to a different sort of fuel, and this made the work very difficult and the progress very slow.

When I started in Germany to introduce the gas kiln, the straight fired shaft kilns, as generally used in America, were in use in many of the works of Europe. Then there was the Hoffmann kiln which is economical in fuel consumption, but expensive in labor. The latter is the reason that the Hoffmann kiln has not been tried in this country. The Hoffmann kiln is also very expensive to build, and big capital is invested in Germany in such kilns. This system is quite different from the shaft kiln. In this country the lime industry is used to burn in shaft-kilns, and it makes no great difference to go over to the gas system, as the kilns can easily be reconstructed or altered. This is the main reason why the producer gas-fired shaft kiln will soon be generally used, replacing the old or present system in America.

Reasons of Former Failures.

In many cases small shaft kilns have been fitted with too large and too many producers, and the reason of the failure was that the fire in the kiln was killed by an excess of gas, which did not allow a sufficient quantity of air to enter the combustion chamber. In other cases there was too much draft, and the fire overheated and melted the lining, but did not reach the center of the shaft.

The product was half overburnt material mixed with coke and a consequent waste of fuel. In many cases the producers, the gasmains and the kilns were so arranged that the gas started to burn inside the producer and in the gasflues, losing the greater part of its efficiency before it reached the lime. The greatest trouble, which has caused many failures and which I had to overcome myself, and for which I at first was not prepared, was caused by soot filling the gasmains and gasflues, thus preventing a clear passage and equal distribution of the gas. The producer gas fired kilns that are working in this country, so far as I can ascertain, are operated in a similar manner to direct fired shaft kilns. This means they are burning the producer gas inside the furnace with cold air which they draw from outside. With a good bituminous coal, containing much volatile matter (high-grade illuminating gas) they may get a pretty good result, but a good deal of the efficiency is lost in the furnace; and this is one of the reasons that the kilns have only a very small diameter and the economy is not very considerable.

Concerning Different Fuels.

I can say from my experience that nearly all kinds of fuel may be used if the producers and the kilns are properly arranged for them.



EUROPEAN KILN WORKING BY SCHMATOLLA SYSTEM.

Wood gives a very good gas, and it is very easy to gasify. Wooden slabs, shavings and similar waste of sawmills, which are very often destroyed in large quantities in refuse burners, are much better than the big pieces of wood, but sawdust requires a special producer with forced draft attachment.

Lignite and brown-coal vary widely in the different deposits, according to their age and other conditions, but if it looks similar to charred wood these fuels are mostly very easy to gasify without the use of forced draft, but sometimes the most experienced expert meets with unforeseen difficulties. There are some very good looking lignites, for example, in Texas, showing large lumps when they come from the mine which crumble into dust as soon as they get wet or heated, and such a fuel of course must be gasified by forced draft (but not by steam blowers), and the producers must be specially designed to meet the difficulties which are caused by such qualities.

Peat is very extensively used in Europe for producing gas and burning lime, but most varieties of peat contain much moisture and it is better to separate the gas from the water before it is introduced into the kiln.

Hard coal, anthracite and coke, can be gasified in lumps by natural draft, but when they contain much dust or fine stuff the air must be blown through the producer. With such fuel a great quantity of steam

may be mixed with the air, and steamblowers may be preferably used.

Bituminous coal can be gasified also in the form of slack, or mixed with fine material, by natural draft, as the fine material forms lumps inside the producer; but forced draft in most cases provides an increase in the output of the kilns.

I know that in America you like to build one large producer and feed a battery of kilns (each of which are comparatively small) from this one producer to save labor. But I prefer and would advise you to build larger kilns for large outputs, and medium sized producers that can be easily cleaned, close to the kiln, and so avoid long flues which mean a loss of heat and introduce soot troubles. One producer may be very properly arranged between two kilns.

To show you the development of my gas kiln I prepared a number of drawings, showing in Figs. 1, 2, 3 and 4.

Fig. 1 shows at the left side two illustrations taken from the first edition of my German book about "Gasproducers and Gasfiring," which was published in 1901, a few years after I had started to build gas kilns for lime burning. The upper figure shows a shaft kiln with one producer for lignite as fuel. The shaft has a similar shape to the kilns which are

used in this country. The shaft is surrounded by a long gas main which is connected with the producer and with the shaft.

The lower figure shows a larger kiln with two producers in elevation and plan view.

The figure at the right side shows more modern types, designed a few years ago, and published in the new edition of my German books about gas producers and kilns, issued in 1908 and 1909.

The upper figure shows one shaft and one producer connected by straight gas mains, which can be easily cleaned and controlled from the outside. The producer is one for bituminous coal and uses natural draft.

The lower figure shows an older design where straight but longer gas mains are used, and the gas producer is arranged under the ground. I now prefer the upper arrangement, where the kiln and the producer stand on the same level, so as to have the gas outlets of the producer and the gas inlets of the kiln on the same level.

The kilns shown in Fig. 1 all correspond more particularly to the European conditions, where they still prefer kilns made of brick masonry.

Fig. 2 sheet is designed for and corresponds to American conditions, the outside brickwork being replaced by steel jackets or shells.



FIG. 2. ELEVATION.

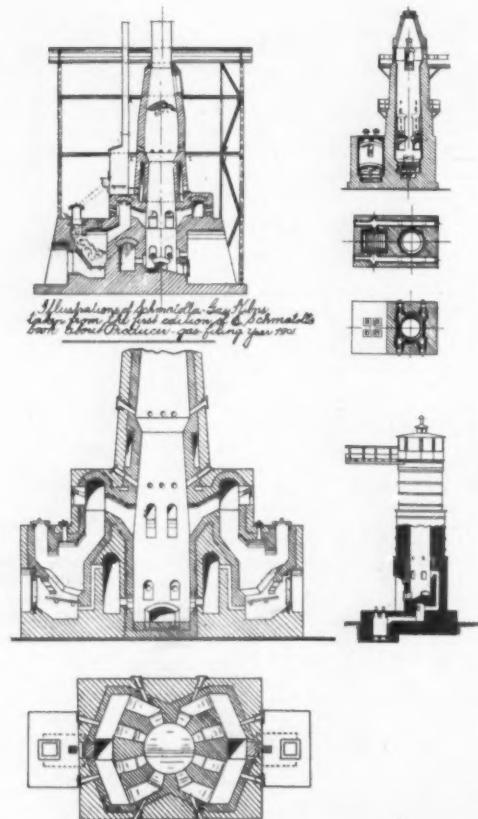


FIG. 1.

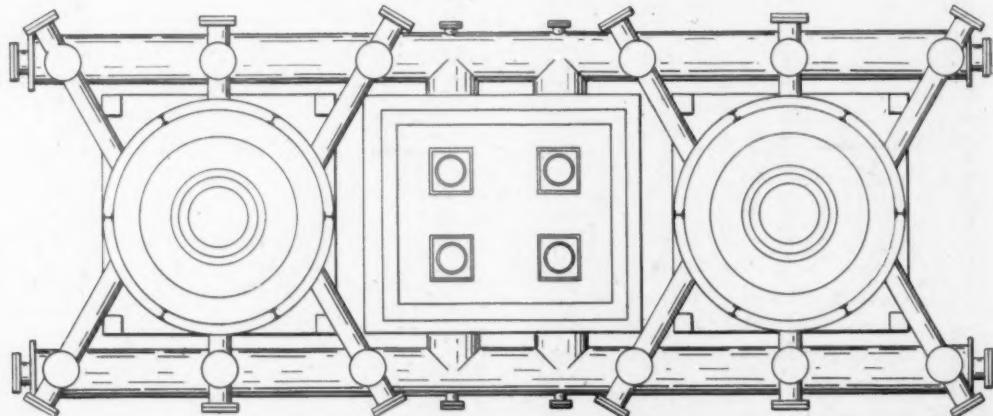


FIG. 2. AREA.

This drawing shows two kilns and one large producer arranged between the kilns and connected with the latter by two straight mains and short cross-pipes. This plant was designed for the Glencoe Lime & Cement Company, St. Louis, Mo.

Fig. 3 is quite a new design, by which, after having studied the American conditions, I have tried to show how I would recommend to arrange a battery of lime kilns.

This design gives an elevation, seen from the front and from the side and a plan of the battery. The producers are arranged between the kilns, and all long flues are avoided. Each kiln with one producer is designed for an output of about 20 to 25 tons of burned lime per day, which gives medium sized kilns and medium sized producers. Above the producers coal hoppers are arranged between the kilns with one chute for each producer, to avoid rehandling of the coal. For conveying the stone and the coal to top of the kiln a cable railway or some other conveying device may be arranged. In the middle of the battery, under the ground-floor, there is a conveyer belt upon which the burned lime, as it comes from the kiln in a perfectly cool condition, is dropping.

Fig. 4 shows a plan view of a double kiln for an output of about fifty tons, with two producers, connected with the kiln by very short pipes to avoid losses of heat, soot trouble, and to simplify the construction.

Producer gas fired kilns are not new in this coun-

try, but all that I have had the occasion to see, where working under conditions similar to the direct fired kiln, and the gas is burned in the furnaces before it enters the shaft of the kiln. Therefore a part of the efficiency and length of the flame is lost, and the kilns have the same small diameter between the gas inlets as the direct coal fired furnace kilns—in most cases 6 feet or less, whilst a Schmatolla kiln, where the flame is developed inside the shaft, can have a diameter up to 9 feet between the gas inlets (or furnaces). The 6-foot diameter kiln, when cylindrical, has only an inside horizontal shaft area of about 27 square feet, whilst the 9-foot diameter shaft kiln has a useful shaft area of 60 feet, and the capacity is therefore more than double that of the small kiln. The larger the diameter between the opposite walls of the kiln, the smaller of course is the loss by radiation, and the cost of building the larger kiln more than double the output, are not twice as much as that of the small kiln, but only 33 to 50 per cent higher. I wish to explain further that the larger kiln does not require much more labor than the small kiln, and this makes a substantial economy of labor with the larger type. By giving the shaft of the gas kiln an oval shaped area the output of such a kiln may be increased up to fifty tons of burned lime per day.

As the heat which is accumulated in the burned lime is utilized in the cooler of the Schmatolla gas kiln, the lime is drawn from the kiln perfectly cool and can be shipped immediately without rehandling.



EUROPEAN KILN WORKING BY SCHMATOLLA SYSTEM.

Outlook Never Better.

MILLVILLE, W. Va., Feb. 12.—The Harpers Ferry Stone and Lime Company, whose plant is located here, was not in operation last year but expects to resume March 1. They will install a 3,000-foot tramway and will build three kilns. Regarding business, they say: "We do not think the business outlook was ever better." The officers of this company are W. W. Rees, president; D. A. Rees, secretary and treasurer; C. A. Tipton, general manager.

A Good Year Ahead.

BROOKLYN, N. Y., Feb. 7.—The Hudson River Lime Company, whose sales office is located here, have the plant at Ravenna, N. Y. It is located on the West Shore Railroad. The lime is of high calcium character. N. W. Young, of this company, says: "Inquiries received indicate that there is a good year ahead."

Best Ever Seen.

EAST SYLAMORE, ARK., Feb. 19.—The Geo. R. Case & Sons Lime Company are operating their plant to its fullest capacity. They have been in the lime business here two and one-half years. They expect to erect two more kilns this spring and equip the quarry with air drills. Regarding trade, they say: "The year 1910, we believe, will be the best ever seen."

Will Put in Hydrating Plant.

BALTIMORE, Md., Feb. 16.—Robert D. Green operates six kilns at his plant and makes lime from oyster shells. He says regarding the outlook for 1910 that it is excellent, and expects to put in a hydrating plant soon.

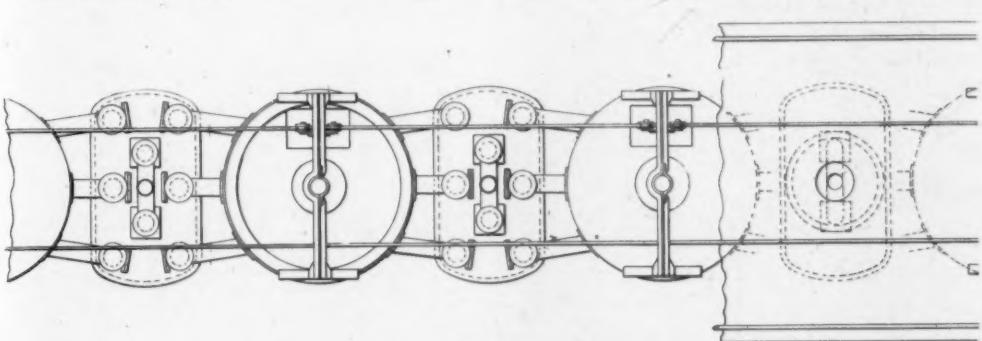


FIG. 3. CROSS SECTION OF FEED.

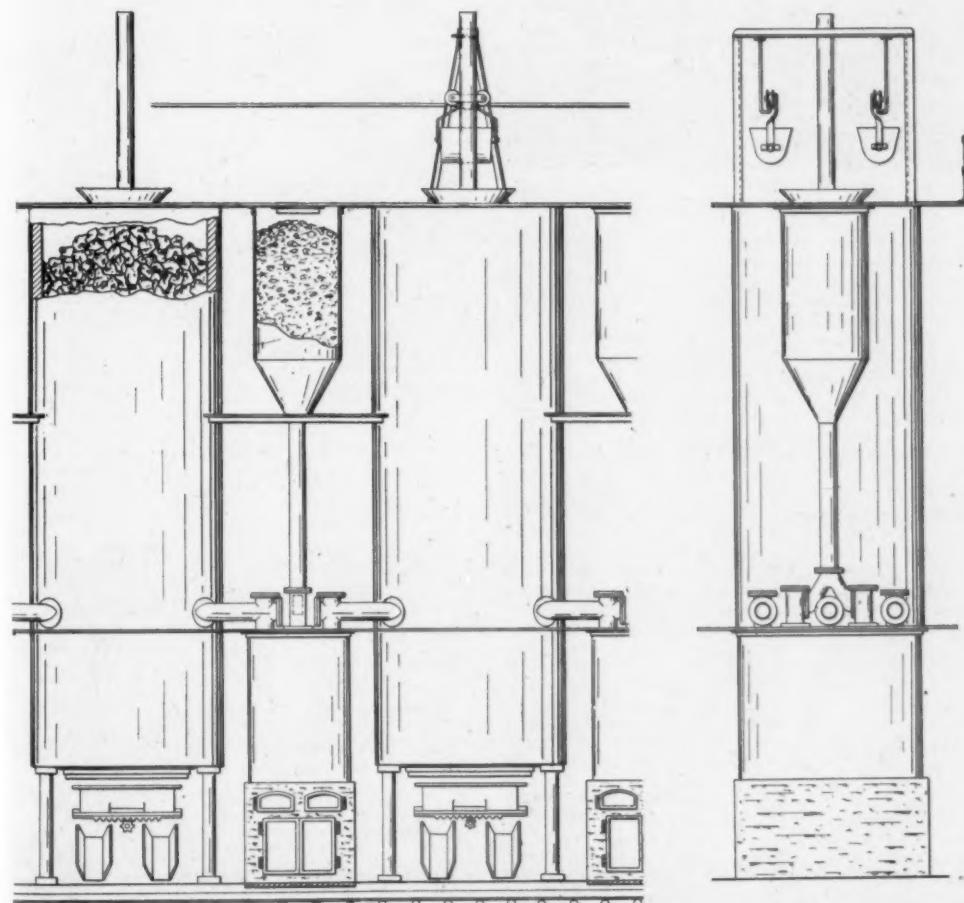


FIG. 3. ELEVATION.

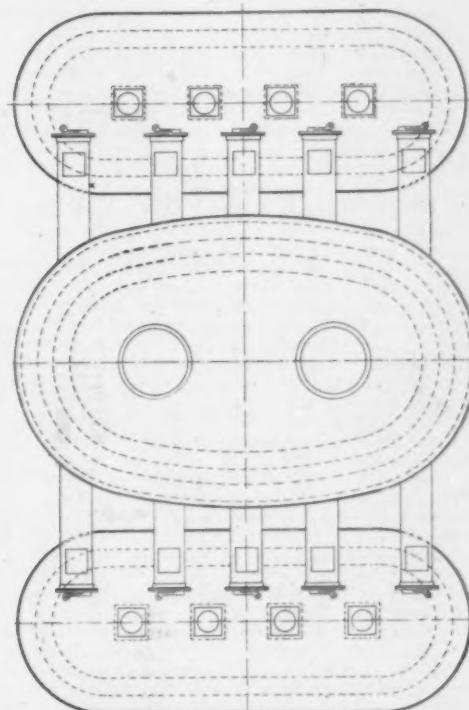


FIG. 4.

QUARRIES

OHIO QUARRYMEN.

Road Material Producers and Contractors Hold Progressive Business Session.

The annual convention of the Ohio State Stone Club was held in the Southern Hotel at Columbus on Friday and Saturday, January 28 and 29.

This representative and progressive body of crushed rock producers and expert practical road builders has become the most important organization in their special line in this country. This fact was brought out during the convention by the statement that a conservative estimate of the total investment in the quarries and equipment of the members amounted to no less than twenty-five millions of dollars in the states of Ohio and Indiana. The club has been actively at work for almost five years, and its efforts have been directed to the securing of better results from the operation of quarries as well as in the road building branch of the business.

These men have built thousands of miles of the best macadam roads in the country, and the state of Ohio may be justly proud of the progress of road building within her borders. They are a broad-minded and successful set of business men who realize the enormous importance of their operations and its direct bearing upon the advance of civilization, requiring co-operation to produce the best intelligence for working into distinct shape the fundamental problems attendant to the production and delivery of the primary material for the construction of roads, as well as for the other new purposes to which the product of the crusher has come to be used in the last few years.

The unsatisfactory lack of uniformity in the specifications for crushed rock have been the means of keeping the quarrymen in the undesirable position of a producer of raw materials and not that of the producer of a finished product of known classification. This matter was discussed at some length and steps taken through a committee to handle the matter of preparing a set of standard specifications, on which crushed products will be produced and classified to be of the most convenient use for every user of the crusher product.

The organization is working hand in hand with the state highway commissioner and with the other road building authorities in the progressive state of Ohio, looking to the end of building the best roads that money can buy in equity to the public using the roads and to the quarrymen and contractors who produce the material and construct the highway.

Charles L. Ireland, of Van Wert, O., was elected president to succeed Allen Patterson, of Lima, who has done honor to the office of president for two successful terms. W. H. Loy, of Findlay, was re-elected secretary and treasurer. Other officers and committees were duly elected and appointed and will be mentioned in the proper place in these proceedings.

MORNING SESSION OF JANUARY 28.

There was a goodly number of the membership of the club in the spacious lobby of the Southern Hotel long before the hour for calling the meeting to order.

President Allen Patterson opened the convention with a few well chosen remarks, and in his ambitious way got the ship to moving by calling on Secretary Loy to read the minutes of the last annual meeting, together with the reports of the special called meetings held during the year. The report was listened to with interest and with a few commendatory remarks from various members they were accepted and approved as read:

Charles L. Ireland, Chairman of the Legislation Committee, told of the co-operation with the legislature of the state in providing good laws and road rules, and the elimination of unfavorable and ill advised legislation upon the matter of road building.

Col. George B. Christian commended this report and said: "This shows up the stone men in a progressive light; to take the initiative and show the law making powers of the state the right and wrong of matters relating to quarry operations." He asserted that the stone quarry is not a dangerous business, and cited his more than forty years' experience with a lesser number of accidents than occur in the streets of the best regulated cities. He said the bill

now pending in the legislature would break any industry up by damage suits if its provisions were lived up to the letter. He cited the enormous development in the state of Ohio, by industries, which have invariably been conducted along the form of corporations and asked those who could remember the time when there were very few corporations doing business in the state of Ohio to compare the present commercial improvements with that period before the corporation method of doing business was developed. He aptly compared the advantages of his farming interests to the disadvantages of his corporate interests in the quarry business and other lines. He said, no farmer pays his fair share of the taxes, while every corporate business is loaded with every type and kind of tax, including liability insurance and every other kind of responsibility. Look at the statistics and it will be seen that the corporations of the state of Ohio have made the state. Ninety per cent of the taxes are paid by corporations, while every safeguard is thrown around the farmer, as if he was a petted infant requiring a nurse to look after his every want.

Take the butterine and butter legislation as an example of the fool legislation in favor of the farmer. Some of the stuff that is made in the country and called butter when laid alongside of the chemically

legally reject material in any other way, and this is one of the things that we can secure if we insist upon it. It is up to us to get in behind these objectionable features of our business to call a halt and to provide for the needed improvements. The quarryman has got into a rut of letting everybody else run his business except himself by accepting rules of inspection, unmeaning specifications for material, impossible orders for delivery, and conditions under which the money for our low priced product can barely be collected, and in some cases with all our efforts it ends in a loss either of a part or the whole of the account. I am heartily in favor of the united action of this body to defend our rights and to provide for better systems for conducting the business of furnishing road material. I am convinced that this club is working intelligently and conservatively to the end of giving good service, good material for good money, with security to all concerned as to the balance of the values involved. (Mr. Christian's remarks were accorded a hearty applause, for he forcefully expressed the sentiments of practically every member present.)

The treasurer's report was next read in detail showing a healthy balance in the treasury for the conduct of the business of the association after the dues of the present meeting are collected.

Charles L. Ireland then read the report of the executive committee, taking up the matter of the meetings held since the last convention seriatim, explaining the cause and purpose of each. Full explanations were brought out by questions of the members and the motion for adjournment for luncheon was then carried.

AFTERNOON SESSION, JANUARY 28.

President Allen Patterson rapped for order at 2 o'clock, and requested Col. George B. Christian to introduce George S. Marshall, Mayor of Columbus, which he did in the following graceful words:

"As representatives of great industry here assembled, exponents of more than twenty-five millions of the total wealth of this great state, all devoted to the manufacturing of road materials, we are assembled in the interests of our business. Ohio is no longer a state of farmers. Our greatness has been made by our manufacturers. Ohio has been blessed tremendously, and her population has increased four or five millions and her wealth has kept pace with this wonderful growth, which has been sustained and built up by the products from her mines and quarries. All of this has benefited the state, and right in the center of it we have this great and beautiful capital city and that is why such a meeting as this rightfully should be held at Columbus. It is my pleasure to welcome and to introduce the chief executive of this imperial city to the Ohio State Stone Club, and I understand that he desires to extend to us a formal welcome."

Welcome of the Mayor.

George S. Marshall, Mayor of the City of Columbus, said:

"It is a pleasure for me to welcome your club, not as a mere formal matter, for we have more conventions in this city than there are days in the year. This is the convention city of Ohio, as Col. Christian has said. We are not selfish but accustomed to having visitors within our gates and we try to make people feel when they come here that they want to come back again. Hospitality is acquired somewhat. The south is pre-eminent in this regard, and this is well known everywhere as an attribute of Columbus.

"This city has a reputation for growth which is hardly equaled by any other in the nation, and certainly no other within the state of Ohio. Like every other city, it has had its troubles with its street construction and with its street repair problems. A new spirit of enterprise has taken hold of the road problem and street building here as elsewhere. The national government and the state co-operating have built a sample road just east of the city and it is possible that the practical road builders here would appreciate a visit to this model piece of road which is intended for the education of the technical experts, the public and the lawmakers alike.

"In 1912 there will be a centennial celebration in this city, and in connection therewith will be shown all of the industries and manufactures of the city and of the state as well. Many have been advocating a greater Columbus, but I recommend a better city first and then a larger. I would like to see a splendid city and a model city and it is such a city that I invite you to participate in.

President Patterson gracefully expressed his thanks for the mayor's attention and courteous reception. He adjourned the meeting for ten minutes so that all of the members could join in a hearty handshake with the mayor, and this was a pretty and enjoyable feature.

On resuming the business of the meeting the President called on Col. Christian.

SHALL THE ROCK PRODUCERS OF OHIO ADOPT A POLICY RELATIVE TO A REFUSAL TO PREPAY FREIGHT?

By Col. Geo. B. Christian.

Col. Christian said that all such problems as this require the full study of the subject. I declare that the stone men of Ohio individually and collectively are the worst mistreated men in the world. I built the first improved road in Marion county more than forty years ago, and the same needless troubles that affected that case are still in evidence in this industry today. The worst of these is the fool farmer inspector who is inspecting something that he knows nothing about, and we with more than twenty millions of dollars are conducting an



ALLEN PATTERSON, LIMA, O., THE RETIRING PRESIDENT.

ROCK PRODUCTS

industry without making a cent on account of the irresponsible and unintelligent methods which are entirely unnecessary and which are worked systematically to our disadvantage. The good roads movement is sweeping the country, and we who build the roads, if we are to have anything to say in the movement, we have got to get together and let the authorities know what we want. We have been working in the dark, and we want to stop that and work together and insist upon intelligible specifications on which we can ourselves know when we have complied with our contract, and prove it to anybody and everybody besides. I know all about the matter of specifications; I have drawn them up myself, and mine were not better than any other engineer's. The railroads have taken care of their business, and we have been contributing to it by submitting to their rulings concerning prepayment of freight, which places the producer at the mercy of the inspector, the contractor, the commissioner, or almost any farmer who may happen to come along. There is no other business under the sun that furnishes its customer with the capital to conduct theirs, and when we capitalize the road contractor we are simply lending so much money to him without interest. There is not a man here who has added anything to his bill for the extra investment of carrying the account of irresponsible contractors, besides, when you prepay the freight you are furnishing capital for the railroad company and then you take the short end of it at every part of the transaction and sell your goods in the first place at less than the cost price, unless everything about your quarry and plant is running with almost miraculous regularity. You are carrying everybody. It is the greatest injustice to ourselves that we contribute in this way to everything and everybody in sight. Once you declare that you will not do it you will shake out the undesirable contractor and be rid of him forever. There is no reason why he should not secure you for the material that you furnish, and if he had to do this you would find a better class of contractors in the field. The railroads take an unfair advantage every time they get a chance, and naturally they try to put every account where they can get a responsible man to stand for their freight charges. This is always the quarryman, for the strolling contractor has no abiding place or any tangible security. We have got a perfect right to state that we want to bid direct to furnish our material to the state and cut out the irresponsible contractor and cut out the prepayment of freight and all the rest of the foolish contributions that we have imagined ourselves forced to make to other people's operations. The Lord knows we have plenty of troubles in our own. It is no more than right that we should have something to say about the selection of inspectors and about the classification of our product. The engineers of all the counties now have different specifications, yet the same product from the same screens and the same quarries can be delivered to all of them. Specifications of two counties adjoining were called to my attention the other day, and there was not a word alike in either of them, and yet cars loaded for one could be delivered to the other without any objection, although both could have been turned down by the inspector, or both passed in view of the fact that the material was badly needed when it arrived. What we need above everything else is to inject some common sense into our business and into the method of conducting it. Now we come to the point which is most important of all. If the laborer is worthy of his hire, a reasonably fair profit is just and right to the man who operates a quarry and runs a crushing plant. I am ready to join heart and soul in the movement to better these conditions in each of the counties in the state, and have it fully understood amongst ourselves as manufacturers.

S. M. Hall—Every quarryman knows that it takes more money to finance contractors than it does to run our own business. When it comes to the matter of inspection I happen to know of an engineer who ordered $1\frac{1}{4}$ " material and further described it with the words, "no dimension larger than $1\frac{1}{4}$ \"", as a parenthetical appendage to the specification. When the car was delivered to him he took a rule out of his pocket and picking over the pieces found one that measured $1\frac{1}{2}$ " in one direction and instantly announced that he intended to reject the car. This demonstrates that he had no adequate idea of how the material is produced, and it required a long explanation to convince him that the piece of stone he held in his fingers passed through a $1\frac{1}{4}$ " ring. This suggests the thought that inspectors ought to be properly qualified. They must have some knowledge of the practical requirements of the material for the purpose of making a road. We have all been stung in this way. I do not believe there is a single man present who has not.

Mr. Ireland—Shall we just stop at that or shall we present something for the consideration of our law makers?

S. M. Hall—I move that a committee be appointed to draw up a resolution to refuse to prepay freight in all cases on road material.

Mr. Ireland—There may be a legal phase against the putting of such a resolution into practice.

C. W. Ryan—I do not consider that there is anything illegal about refusing to prepay freight. If I sell my goods at my plant it is a matter of agreement whether I pay the charges to delivery or whether I leave it to my customer to do so. When it comes to this question of lending money to the contractor in this way, if there is any such a law it should be repealed. We have a perfect right to refuse to lend money in this or in any other way.

Charles W. Woodruff—As for my company I will say that we are through with the prepaying of freight, and this goes in all cases.

H. L. Tarbox—How about a prepay station, where there is no railroad agent to collect the freight? I feel that if we should have to pay the freight in such a case we should add a percentage to the bill.

Wm. J. Sprow—We have had similar troubles to those mentioned, the same as everybody else here. I believe it will be a good thing to add 5% to the bill

where prepayment of freight has to be made. Our company will never make prepayment of freight again.

M. P. Goetschius—We have had experience with shipping to blind sidings and it has been expensive. We now insist on the contractor putting up the money to stand for the expense. We will not do it any more.

E. T. Paul—We, of course, have had the same experience, and where such a rule is uniformly adopted we are confident that the contractor will find some way to pay up. If we all refuse to do any other way there is nothing else that we can do.

A. A. Hall—I believe it a good plan to compel the contractor to furnish a bond for all material as well as the labor.

President Patterson—We will put further discussion of this matter over until the morning session, as I desire now to take up the matter of the "Advantages and Disadvantages of Universal Specifications," for I see that J. C. Knesely, the assistant to Highway Commissioner Wonders, has just come into the room with his paper.

Mr. Knesely read a paper which outlined the experience of the Road Commissioner's Office and discussed the question of universal specifications from the standpoint of the road commissioner. He had



CHARLES L. IRELAND, VAN WERT, O., THE NEWLY ELECTED PRESIDENT.

never seen anything of the kind put into practice, but he felt that they were doing the best they could amidst the difficulties surrounding the case. Mr. Knesely promised to send his paper to ROCK PRODUCTS for publication, but up to the late hour of going to press the copy of his paper had not arrived.

S. M. Hall was called upon to answer the statement made in the road commissioner's report from the standpoint of the stone producer, and his paper is given herewith.

THE STANDPOINT OF THE STONE PRODUCER.

BY S. M. HALL.

The subject of advantages and disadvantages of universal specifications covers a wide scope of territory, and my predecessor, Mr. Knesely, representing the Highway Department of the state, has fully and very cleverly handled the subject.

The question of universal specifications for the preparation of broken stone for macadam purposes is at present, and has been for years past, a bone of contention on the part of stone producers.

The wonderful development of the business has caused an investment of thousands of dollars with which to produce the various sizes of stone to meet the requirements for the construction of roads. Those engaged in the manufacture of machinery with which to break, screen and convey stone have become marvelously efficient and expert in their line of business by providing equipment which meets the demands of the trade.

The improvement of appliances has kept pace with the progress of the times, and it seems that the end is not yet at hand for further advancement in this direction, and gentlemen, the stone quarrymen have been compelled to keep strictly in advance of the progress of the business in order to be prepared to produce the numerous dimensions of stone regardless of time and expense involved.

In many instances specifications deviating materially from the ordinary are drawn without considering whether the product in question can be produced without requiring the stone quarrymen to make radical and expensive alterations in and about their plants, or perhaps necessitating the installation of additional machinery and appliances to cope with the conditions.

I venture to assert that not one of the gentlemen assembled here this afternoon has ever been interviewed previous to the drafting of specifications by an engineer on the subject of adapting specifications that would meet the conditions of his plant.

Instead of the engineer being consulted by the stone producer in such cases, the stone producer is always at the mercy of the engineer and is obliged to meet all of his conditions.

Gentlemen, is it not a fact that with the conditions confronting us, our places of business can be termed merely experimental plants for and at the command of public authorities, and we here assembled have bowed and submitted to their wishes regardless of the enormous expense incurred?

Broken stone roads were built in France in 1764, and in the early part of the 19th century two systems of roads were built in England by Tilford and Macadam; the stone roads in our country being named in honor of the last named builder.

Considering the time elapsed since the introduction of stone roads into the United States, ample opportunity has been given in which to determine upon a universal specification system for the size of stone best adapted for road construction; and the time has arrived that the experimenting stage relative to the use of various sizes of stone and mixtures thereof should cease and a uniform system of regulated size of stone best adapted should be used.

The advantages thus to be derived are as follows:

First—Viewing it from the standpoint of a quarryman, a universal specification for the production of stone could be prepared at less cost, due to the fact that less equipment, less storage space, less handling, together with numerous items entailing expense, would necessarily follow; hence the expense of production would naturally decrease.

I desire along this line to call attention to the following specifications which, in several instances are, from a mechanical and physical standpoint impossible to comply with.

I especially refer to specifications No. 1 and No. 2:

Specification No. 1—Stone shall be crushed to pass through a $1\frac{1}{4}$ " ring in any direction, etc., etc.

Specification No. 2—Stone shall be crushed to pass through a two-inch ring in any direction, omitting any other sizes.

Specification No. 3—The stone shall be crushed to pass through a $2\frac{1}{4}$ " ring, and shall be run of crusher thoroughly mixed. After placed upon the road, two inches of screenings, free from dust, shall be used as a top course.

Without doubt, gentlemen, you have a fair sample of what is required to meet such specifications. The absurdity of attempting to require stone to be crushed to pass through a specified ring in any direction is beyond all reason.

Scrutinize, if you please, specification No. 2. Solomon was wise, and there may be room for others, but the wise man is the engineer who drafted these specifications.

Specifications No. 1 and 2 require further comments.

Referring to specification No. 3, a plant producing road stone exclusively would find it difficult to obtain sufficient screenings with which to complete the top course of an improvement requiring strictly run of crusher.

There is a remedy for everything except some of the remedies. What shall it be?

There followed a brief discussion of the question of universal specifications which formed the actual keynote of the entire meeting, and there was on every hand the indication that the rock producers felt that it was possible to make some progress in this direction more than had been recorded in the past, as agreeing both with Mr. Hall and some of the leading suggestions in the report of the Road Commissioner.

Mr. Judson—It strikes me that on this subject of universal specifications there is one thing that has not been touched upon and that is that there is practically no uniformity in the hardness of the rock that is offered for road work. We ask for stone of one type and it makes a big difference in the crushing strength according to the hardness of the stone. I would suggest that it would be a good thing if this organization would classify the different types of rock and make classification according to the sizes and according to the hardness of the stone itself.

Mr. Knesely—All the rock that has been used this year has been generally too small in size. The Road Commissioner's Office has only to complain of too much of the smaller sizes than is satisfactory.

Mr. Ryan—if a larger percentage of 3" size is wanted it is easy enough to set the bell of the crusher so as to get 60% of that size. It is hard to regulate the flow of the material sometimes. It operates with the weather and other conditions.

The result of a very full discussion was the appointment of a committee consisting of Messrs. Woodruff, Christian and S. M. Hall, to act in conjunction with the Road Commissioner's Office and work out something in the direction of a universal specification.

About Contractors Giving Bond.

President Patterson then called upon C. L. Ireland to lead the discussion upon the subject "Shall We Ask for Legislation Requiring Contractors' Bond Covering Labor and Material?"

Mr. Ireland said in part: "Indiana now has a law in operation which is just about the proper thing in the way that it operates in practical work. A majority of the stone men know the actual cost of producing road material as well as the work of building roads. We carry a daily cost sheet in our operations which practically covers each and every point as was illustrated in our convention last year. One of our difficulties is that we have to sell our product to the farmer contractors who make blind bids without even consulting the stone man or asking him to make a price on the goods that he has to furnish.

I find that the reliable contractors will not figure jobs at cost nor make a blind bid. The only way to make a profit at some of the prices at which roads are bid by the unreliable contractors is for them to skin the road of rock and then beat the producer of material out of his pay. It would seem to me that all we would have to do is to have the law adjusted in such a way as to make the contractor put a certain tonnage of material on the road and pay for that much material. It will be easy to keep track of the tonnage by counting the cars that are sent to the contract. As long as the proper amount of material in this way is to be put on the job it is more than likely that it will be put on properly, and there is no way then for the contractor to skin the work.

S. M. Hall—It has long been the custom for contractors to give a bond for the labor involved in their contracts, and I see no reason why it is not equally as just to insist that they give a bond for the material also. Most of the county engineers know that we need this kind of protection, and I believe that a majority of them would favor such a law if we could have a bill of that kind introduced.

Mr. Ryan—I think we have got the law now. I just had an experience whereby I was able to recover under a law that is in operation at the present time.

Mr. Woodruff—We have a lien law covering building materials, but I do not believe that it applies to road materials handled in the way that we must handle our product. Our company will not pay freight for anyone. All of our product is sold f. o. b. our plant. We favor the matter of a bond for material as well as labor.

C. L. Moore—All contracts in Paulding County I understand provide for a bond for both labor and material.

Mr. Ireland—in the city work of Van Wert, we were able to get bonds for both labor and material, but in Indiana, contractors have to give a bond for double the amount of the bid, and that amounts to a good guarantee for everybody who is interested in the work in any way.

Mr. Ryan—I am in favor of a bond for the material, but not a bond in excess of the value. If the bond is good that should be sufficient.

L. W. Statler—I think it would be a fine thing to appoint a committee to thresh out this matter and to draw up a suitable resolution to cover the needs of the case.

W. H. Loy—I move that the matter be referred to the Legislative Committee with instructions to take such action as they find necessary. Motion carried.

President Patterson—There is certainly a need of a law which will provide for bonding both the labor and material on road work for the protection of the man who supplies the tonnage. He then announced the invitation of the Woodruff & Pausch Company to visit their plant in the vicinity of Columbus, stating that the visitors would thereby have the opportunity of seeing the largest crusher on earth in operation. This invitation was hailed with pleasure and many of the members signified their intention of accepting the same.

The president then gave one of his interesting little speeches on the subject of the value of work that this association is accomplishing for its members and called on A. A. Hall to talk upon the subject.

A. A. Hall—This sounds something like an experience meeting, and from my standpoint I will say that the confidence engendered amongst the rock crusher interests is certainly worth a great deal.

J. A. McCall—Meeting together as we do, I believe I have attended every meeting, leads me to say that I cannot speak too highly of the benefits that I have derived from these meetings.

Mr. Ireland—I cannot find words to express my estimation of the value of the Ohio State Stone Club. During the past year, we have made a great deal of progress. The Columbus and Marion producers of stone have joined the club. This is worth something, and I feel that we are entitled to claim that this club now represents practically the entire industry in the state of Ohio.

Mr. Loy—at the start we had everything to gain and nothing to lose. We are learning the value of confidence and a square deal for all. We are certainly in a position now to measure our product by the ton, and this is worth a great deal in comparison to what we were up against several years ago.

Mr. H. Voges—I will say, gentlemen, that the first change in our operations in the direction of improvement was to drop the measurement of sales by the yard and adopt a ton measurement. We have found that it is the only fair way, the only just way both to ourselves and to our customers.

Mr. Knesely—I would like to ask how can the ton measure be applied in the work of the Road Com-

missioner, where invariably the specifications call for yard measurement on the finished road.

Mr. Ryan—I would like to answer that question by another. What other commodity is sold by any other route than by that of just weights? The scales are the type of justice between man and man. The quality of the stone itself, which has been referred to in this meeting, is parallel to weight regulated by nature. As a matter of fact there is a variation of 50% in the amount of material one way or the other when it is measured by the yard.

Mr. Knesely—I do not see why one can't account for all the material no matter how it is measured, whether by tonnage or by the yard displacement.

Mr. Ryan—Don't you see that it is just as easy to tell how much road 2,000 pounds of rock will make as it is to tell how many yards it will make?

Mr. Knesely—Not when we specify the depth of that road. The Road Commissioner recommends payment by the depth of the finished road, and I do not see how we can adjust your tonnage suggestions.

Daniel Seitz, Assistant Highway Commissioner—I will ask how heavy is your stone? I have no objection to measuring it one way or the other, so that it is intelligently done. We, in the Road Commissioner's Office, go by dimension only. I do not know the weight of stone, but if this is a known and constant factor it would be very easy to translate the one into the other without difficulty. Now in the matter of the irresponsible contractor, I will say that the Highway Commissioner is quite as anxious to have good contractors as the stone producers could possibly be. The political aspect of the matter has a great influence, and it is one that is hard to get around. However, I will say that we want in the way of specifications, "1½" to dust," and this means almost all to dust. Second, 1½" stone and third, 1½" to 3½" divided into equal proportions. Now, how can we specify so as to get this material? The problem is to secure an even distribution of sizes, that is to say even as to the regularity of sizes.

Mr. Sprow—Why don't the contractor see that you get the kind of stone that you require?

Mr. Seitz—We are always anxious to get just what the contract calls for, but this does not always seem to be clearly understood.

MORNING SESSION, JANUARY 29.

After a pleasant evening at the theater and with the members dropping in from the pleasant visit to the Woodruff & Pausch plant, which will be described more fully later, President Patterson called the third session of the convention to order by asking Mr. J. W. Weldon to lead the discussion on the "Difference in value of crushed stone in various sizes where separation is exacted."

Mr. Weldon had not prepared a formal paper, but proceeded as follows: "I do not see how we can do much or make much progress in this matter. Every specification is different, and it would be impossible for any man to provide for all of the separations which might be called for in the storage at his plant. I look upon some of the separations as impossibilities, and they seem to be drawn that way or as nearly so as they possibly can. The separation of sizes is naturally a distinct addition to the cost. I am merely opening up the question for debate. Of course, the finer the material is reduced in size the more it costs, as there is a greater number of separations and more power is required for driving the screen."

Mr. Ireland—It is not hard to tell what is happening to us. The specifications have been getting the material finer and finer all the time, and the finer the product the more it costs. My last bid was \$1.00 a yard crusher run through 1½" ring. Now if the price was 50¢ for 2½" ring crusher run, and then add 5¢ for each ¼" reduction in the size of the ring down to ½" ring, it would be very nearly right and an equitable basis of calculation.

Mr. Ryan—The handling of the different sizes is what I have found makes up the cost. It uses up a lot of power for handling 2½" crusher run, say about 50¢ a ton would be fair. We ought not to be too modest in asking for a price that is right. I feel that if we add 75¢ for 1½" to 1¼" we would get along better. We could not more than half take care of the business on such a basis. The time has come when we must have price enough to rehandle the goods. We run our quarries economically, but we give the material away, as our product increases in cost and in value as well. We have added big value to every farm in every county where we have built roads, yet we do not seem to be able to get any recognition in our just demands for a living price. If we work our brains to get the things that are our due we may get there. Dishonesty is huge in this business.

Daniel Seitz—The Assistant Highway Commis-



THE OHIO STATE STONE CLUB AT COLUMBUS' JANUARY 29 AND 30.

sioner read a well prepared paper upon the subject of "Water bound macadam" in which he forcefully presented the calculated value as a road material of properly laid macadam when it is wetted down and properly rolled again. It was a strictly instructive paper which was appreciated by all who heard it.

President Patterson then took the floor, saying, "I have been president for two years and am now about to retire from the high office. I want to say that I have encountered no little difficulty in getting the right kind of legal advice. I used the social connections of my home in Lima as a means to get valuable advice, and I think that we should create an office in this club to be known as Attorney for the Ohio State Stone Club. Elect such an officer and turn over to him such legal business as this organization may have, with the understanding that advice is to be free, and to assist us to work up our law business. Recently I have written to every representative and senator in the state asking their support to measures which the members of this club have advocated, and I have received twenty-seven replies and all but two are in favor of our proposition. We simply ask for a legal unit of measure on crushed rock. Now we have specifications calling for approximate measurements only, and this is no way to measure material. We must have somebody for our legislative committee to consult. I feel that if I was an attorney I would be honored to have such a position, and I feel that our members would be able to make up to him the value of his advice to the committees in the business that they might throw to him, because he would soon become very expert in the matter of road specifications and in the right and wrong of quarry and crusher questions. I think that the Executive Committee should be instructed to get a good lawyer to fill such a place as I have suggested."

Mr. Sprow—That is a good suggestion. We have been lame in this matter. I think it would be a good move and a very proper one, and I make a motion that the Executive Committee be empowered to secure the services of the best available man. This was seconded by Mr. Statler and duly carried.

President Patterson—Now it looks as if we have started out to do things.

Mr. Ireland—I have to report from the Executive Committee that we have employed Henry Bentley, of Lima, as attorney for the club. We acted on this, temporarily, and the Legislative Committee recommends to appoint him permanently, as he has already served from time to time in an advisory capacity, for which the officers are exceedingly grateful.

Resolution of Thanks.

Mr. Weldon introduced a resolution of thanks to Mayor George S. Marshall for his cordial welcome and extension of the hospitality of the city of Columbus; to Messrs. Daniel Seitz and J. C. Knesely of the Highway Commissioner's Office for their courtesies and for their attendance and assistance with the work of the meeting; also, thanks were extended

to the Jeffrey Manufacturing Company through the person of M. W. Sherwood, who so kindly piloted the members on their pilgrimage to the plant of the Woodruff & Pausch Company, and saw to it that they could find everything that they wanted in the city of Columbus; also, to Fred K. Irvine, editor of ROCK PRODUCTS, for his attendance and interest in the work of the organization. This resolution was unanimously carried.

President Patterson then called on O. E. Rankin of the Standard Oil Company to talk on the subject of "New Material for the Use of Good Roads."

Mr. Rankin had not prepared a formal paper, but said that the subject was such a broad one that it was difficult to find a place to begin. He talked of the various petroleum products which have been used in the elimination of dust and for the solidifying of crusher products when used in road work. He stated that all of the experiments so far clearly indicated that it was the most economical way to make the



SIDE DUMP CARS DELIVER THE MATERIAL TO CRUSHER.

best possible road obtainable. He recited many instances where this kind of improvement has been used effectively.

President Patterson—I now have the pleasure to introduce to you H. O. Bentley, of Lima, as the official lawyer of this club, as I understand that he has been elected by the Executive Committee which has just acted on this matter. I will say that he is interested with us. He is one of us, and I consider him to be one of the most capable lawyers in the state of Ohio. Certainly the most capable one in our especial line.

Mr. Bentley—None of you know how such an introduction makes a man feel unless you have had Mr. Patterson hand you one like that. It is embarrassing to be elected to anything, and I am not in the habit of being honored in such a way to any great extent.

I came down to this meeting to learn something. I was not a little surprised to find out that this club represented so many millions of dollars of invested capital in the rock business in this state, but I find by putting two and two together that the statement made in this room yesterday was rather inclined to be conservative than otherwise. This club is certainly a good institution and is working in the right direction, and it has a long road to travel yet before it has worked out all the problems that confront the producer of road material. I have been impressed with the conditions that have been repeatedly cited here, and I do not know at present the best plan to accomplish the desired results with regard to preparation of freight. Where there is a right way that is what will always prevail in the end, and this is what is wanted, as I can see by the faces of the men here. I hope you will keep on getting men of this high character in the club and I feel that you will ultimately work out your uniform specifications, which will necessarily be of benefit to the whole industry. I am very proud to be your legal adviser for the coming year and assure you that I will not be found wanting for vigilance as a member and a worker.

President Patterson then announced that the election of officers was in order, saying: "I have served in the arduous position as president of this society for two years. It has been hard work for a man like me, and I have done the best that I could. I feel that I cannot be with you at the next meeting, and therefore I would respectfully request that you elect a successor for me."

S. M. Hall—In view of what the president has said I wish to nominate a gentleman of vast experience and one deeply interested in the stone industry in the state of Ohio, C. L. Ireland, of Van Wert, O. This nomination was seconded by Mr. Loy, and the election was unanimously carried with loud acclaim.

Mr. Ireland—I thank you, gentlemen, for putting this honor upon me, and I will accept it. It is one of the things I most dislike, because of my natural bashfulness. I do not know what to do, and I will have to lean upon you in many ways. I am deeply interested in the success of the stone business, and also in the work of this club. I will use the official legal adviser which you have just elected, and I assure you that whatever I do will be as I see it for the best of the club and for each of its members.

F. L. Byron of the Vulcan Steam Shovel Company handed each of the members a miniature excavator while all were congratulating Mr. Ireland upon his election to the presidency of the club.

The following committees were appointed for the coming year:

Committee on Legislation—C. L. Ireland, Allen Patterson, M. P. Goetschins, Geo. B. Christian, Sr., F. Lawson Moores, Chas. W. Woodruff, S. M. Hall, C. R. Callahan, and J. F. Pogue.

Executive Committee—N. R. France, C. W. Ryan, H. L. Tarbox, Joseph Patterson, C. H. Webster, Chas. Killen, Wm. J. Sprow, — Keefer, A. Acton Hall, and F. R. Kanengesier.

Committee for the Good of the Club—Allen Patterson, J. W. Weldon, L. W. Statler, S. M. Hall.

Vice-Presidents—Geo. E. Mercer, Alex Wagner, H. F. Robinson.

Secretary and Treasurer—W. H. Loy.

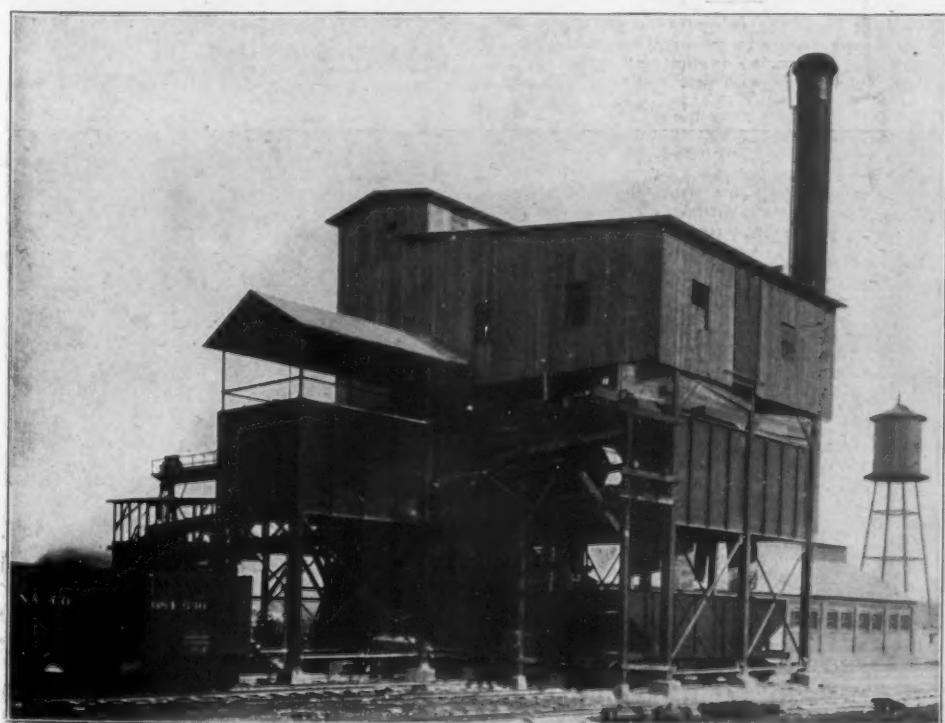
The elections being completed President Patterson called for the opening of the query box, which had been placed at the door of the convention hall at the opening of the meeting, and the queries contained some interesting topics. One query said that the inquirer wanted to know where he could buy a No. 5 crusher. He was given the address of two parties where he might make such purchase.

The second query asked at what price per ton can a storage system be conducted.

M. P. Goetschins, of Ottawa, was called by the president to answer this query. He said: We have recently put in a storage and reclaiming system primarily designed for the storage of five thousand yards of stock. The tracks and all the tunnels and cars cost approximately \$12,000. The system we use consists of running tunnels under the piles of material that are made from the crusher direct on belts. For this we use cotton belts, and we have found that reclaiming is more economical than providing the same amount of storage in the shape of bins.

The Matter of Storage Systems.

This question of storage is one of importance to the crusher operators, for the reason that the cost of the construction of bins is constantly increasing. A few years ago bin capacity was roughly estimated at \$2.00 per cubic yard. No one considers today that it is possible to build any sort of a permanent bin under \$3.00, and the best engineers contend that \$4.00 per cubic yard is a fair figure to estimate. The cheapness of the product as well as the enormous



PLANT OF THE WOODRUFF & PAUSCH STONE CO., AT COLUMBUS, O.

tonnage which must be handled in order to make any considerable business, has called the attention of the best engineers of the country to this feature of the crushing plant of the future.

Usually quarry properties are so located that there is an abundance of cheap ground on which outdoor storage could be piled if it were not for the extra cost added to the material by introducing any system of reclaiming. Probably one of the cheapest ways to do this, would be to feed the different sizes of material from the screen upon belts to the storage piles, and have the storage piles surrounded by a railroad track, and then provide a locomotive crane with a clamshell bucket of sufficient capacity to load cars at the minimum cost. This plan is probably the one which will be most widely adopted in the new crusher plants which will be built in the future.

Because of the enormous investment for bin storage capacity, some adequate plan of storage must come to the crusher business by engineers, and by those who are the heaviest users of crushed rock. Practically every concern that builds crushing outfits have their engineers at work on a storage and reclaiming system of this type, and out of all that is being advocated, there is no question that there will be installations of this kind in the crusher business during the present year to a greater extent than ever before.

Mr. Loy told of the storage system which the Hancock Stone Company have been able to install at Findlay on account of the contour of the ground giving them a distinct advantage in this direction. Of course, all such local advantages will be utilized where such a system is used. Mr. Loy stated that the equipment of their storage had proven economical and profitable.

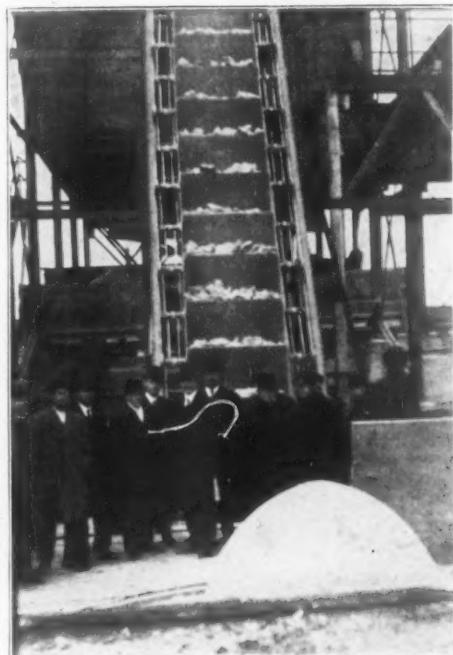
By request of the president, Fred K. Irvine, of ROCK PRODUCTS, addressed the meeting, to express his thanks for the many courtesies which the members of the club had extended to him and to urge the adoption of standard specifications for the product of the quarry, which to be most useful should be distinctly understood and fully applicable to all the uses to which crushed rock is needed in the various industries where it is fast becoming a most important material.

In response to these remarks there was a pronounced impression that the club had an opportunity to realize great progress by drawing up such a set of specifications as would be applicable to the industry in all of its branches.

On motion of S. M. Hall and seconded by L. W. Statler, the Executive Committee were empowered to classify and standardize the product of the crusher so as to secure the benefit of more intelligent specifications and exact knowledge as to what an order might mean when once placed.

Mr. Moore further suggested that in the making of these classifications that they be drawn in such a way as to show the size of the screen which would retain each size of stone. He explained that such a careful definition would make the standard when once adopted universal in its application to the industry no matter what type of natural stone might be involved in the transaction.

With some further discussion on this subject, which was really the keynote of the meeting, from the



OUR PARTY AT THE FOOT OF THE ELEVATOR.

start when Mr. Christian first called attention to the variation in specifications down to the moment of closing the convention. The meeting was adjourned in peace and harmony, and with every member more enthusiastic over the importance of the work of the association than when the meeting was called to order.

After adjournment the special committee appointed reported the following standard sizes for material, to be used by the members of the club in their quotations and for the use of those who specify crushed rock for any purpose.

Standard Specifications and Sizes.
No. 00—Limestone sand.
No. 0— $\frac{1}{2}$ " or $\frac{3}{4}$ " to dust.
No. 1—Crusher run; i. e., 4" down, 3" down, 2" down.
No. 2— $\frac{1}{2}$ " to 1".
No. 3—1" to 2".
No. 4—2" to 3" or larger.

THE SOCIAL SIDE.

On Friday night the delegates to the convention made up theater parties by twos and threes and after the show they gravitated to the grill room of the Southern Hotel where with jest and song till mid-

night hour good fellowship reigned and jovial comradeship was the order.

Saturday morning, bright and early, according to announcement the day previous, M. W. Sherwood of the Jeffrey Manufacturing Company met the members in the lobby of the hotel and in a special car conveyed about thirty-five of the early birds to the great plant of the Woodruff & Pausch Stone Company, where they spent an hour. This plant enjoys the distinction of having the largest crusher in operation. It is a McCully No. 42 and the plant was designed and erected under the direction of L. W. Hewes, of Chicago, the distinguished crusher engineer of the Power & Mining Machinery Company.

The quarries that are operated by the company lie along the Scioto river. The quarrying operations were begun by taking rock out right along the bank the full length of the property, the stripings and other waste being piled up next to the river to form a dyke against incoming floods. The quarry is provided with a steam shovel which is going along parallel with the river bank. The rock resulting from the blasting in the open face quarry is handled by the steam shovel into side dump cars which are drawn by a locomotive to the charging platform, where by means of a crane they are dumped right onto the mammoth head of the McCully No. 42. Pieces of rock half the size of a piano go bouncing into the big throat and come out at the other end ready for screening.

One of our illustrations shows our crowd of early birds under the guidance of Capt. Sherwood who visited the plant right at the foot of the main elevator carrying the material as it comes from the crusher up to the screens. Another view shows the discharge end of the screens where the rejects are put on another runway which carries them back for recrushing.

The storage capacity of the plant is about 6,000 yards, the bins being constructed of heavy steel plates reinforced with structural bars. The whole plant is equipped throughout with the best machinery that money can buy and of the latest design. This outfit was built by the Power & Mining Machinery Company, of Cudahy, Wis., and includes a large stone crusher, which has an opening of forty-two inches.

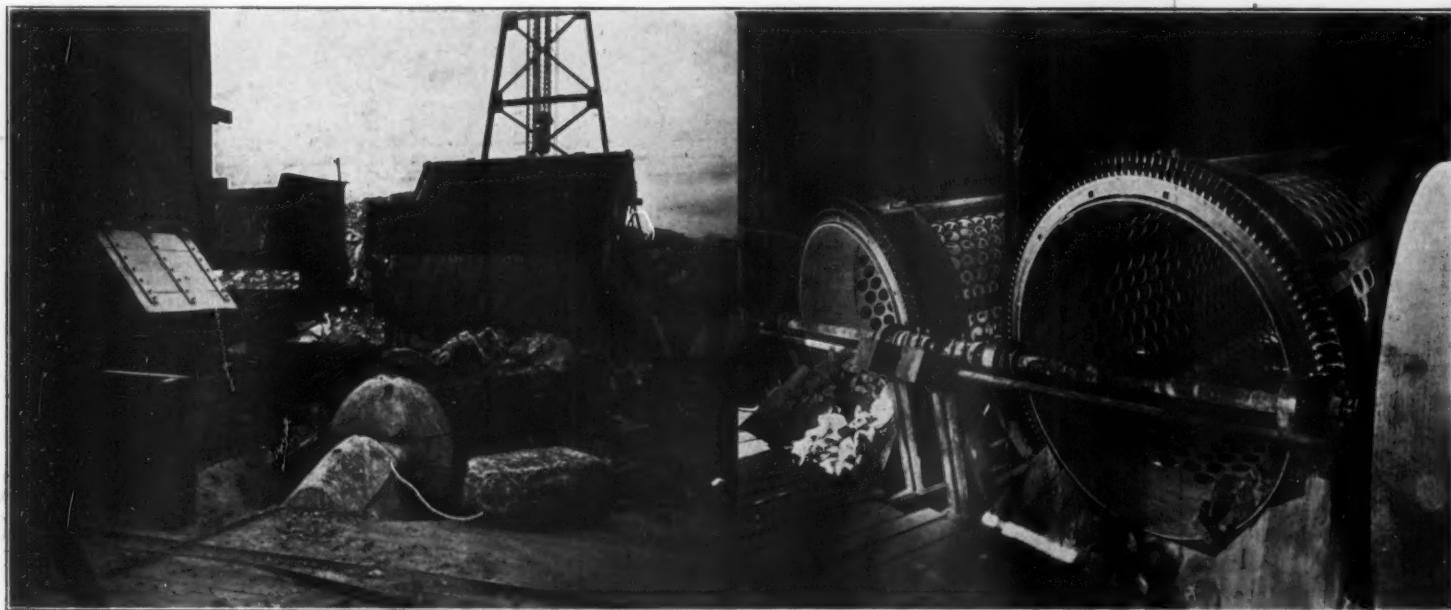
The crusher is set down deep into the ground upon a bed of solid concrete, and only one elevation is necessary. The elevator buckets carry 900 pounds of stone each. The buckets dump the rock into two of the largest screens ever built, each being 7 feet across and 24 feet long. An 800-horsepower engine operates the plant.

The plant has a capacity of 1,100 tons per hour. This means 275 carloads per day.

The Woodruff & Pausch Stone Company is now operating ninety acres of their own quarry land and also about sixty acres of land belonging to the National Steel & Iron Company, known as the Carnegie land. The Pennsylvania Railroad runs right along side of this acreage and also the Scioto river.

THE ATTENDANCE.

Among those present were:
Allen G. Patterson, Bluffton Stone Co., Lima, O.
W. H. Loy, Hancock Stone Co., Findlay, O.



HEAD OF THE GREAT McCULLY CRUSHER

DISCHARGE END OF THE MAMMOTH SCREENS.

ROCK PRODUCTS

John K. Broderick, Broderick & Bascom Rope Co., St. Louis, Mo.
 N. R. France, The France Co., Toledo, O.
 S. M. Hall, Broken Sword Stone Co., Bucyrus, O.
 H. Voges, Springfield Coal & Ice Co., Springfield, O.
 P. N. Dennison, E. I. DuPont de Nemours Powder Co., Columbus, O.
 E. T. Paul, Lewisburg Stone Co., Lewisburg, O.
 E. S. Long, Marion Dump Wagon Co., Marion, O.
 Louis Buchheit, Mitchell Lime Co., Mitchell, Ind.
 Chas. W. Woodruff, Woodruff & Fauch Stone Co., Columbus, O.
 C. L. Moore, Lima Contractors Supply Co., Lima, O.
 F. Lawson Moores, Moores Lime Co., Springfield, O.
 E. L. Byron, Vulcan Steam Shovel Co., Toledo, O.
 Madison Whiteside, Aetna Powder Co., Columbus, O.
 Chas. H. Webster, Sylvania Stone Co., Toledo, O.
 Wm. A. Hearst, Interstate Engineering Co., Bedford, O.
 J. A. McCall, Tarbox & McCall, Findlay, O.
 Monroe Frank, Troy Wagon Works, Troy, O.
 C. L. Ireland, The Erie Stone Co., Van Wert, O.
 H. M. Collins, The Glens Run Coal Co., Cleveland, O.
 A. Acton Hall, Ohio Marble Co., Piqua, O.
 J. T. Herrick, Ohio Marble Co., Piqua, O.
 W. W. Williams, The Williams Contractors Supply Co., Columbus, O.
 F. R. Kanengesler, Bessemer Limestone Co., Youngstown, O.
 E. O. Bibler, Wm. A. Bibler & Sons, Arlington, O.
 L. H. Hawblitz, The France Company, Toledo, O.
 C. W. McKee, The Erie Stone Co., Huntington, Ind.
 H. L. Tarbox, Tarbox & McCall, Findlay, O.
 Wm. J. Sprout, The Wagner Stone Co., Sandusky, O.
 Clyde J. Knesely, State Highway Department, Columbus, O.
 J. M. Hamilton, Marion, O.
 Chas. H. Jackson, Jackson Stone Co., Covington, O.
 L. W. Statler, Statler Stone Co., Piqua, O.
 Chas. Killen, The Lima Stone Co., Lima, O.
 H. O. Bentley, The Lewisburg Stone Co., Lima, O.
 Victor Hammond, The Bluffton Stone Co., Lima, O.
 Robert Mollett, The Lewisburg Stone Co., Lima, O.
 O. W. Sugden, Pluto Powder Co., Buffalo, N. Y.
 M. P. Goetschius, The Goetschius Stone Co., Lima, O.
 C. W. Ryan, The Ryan Stone Co., Maumee, O.
 J. F. Pogue, Hancock Stone Co., Findlay, O.
 E. T. Paul, The Lewisburg Stone Co., Lewisburg, O.
 J. I. Thomas, Rimer Stone Co., Vaughnsville, O.
 Joseph Patterson, Lewisburg Stone Co., Lima, O.
 J. W. Weldon, The France Co., Toledo, O.
 Geo. B. Christian, Sr., White Sulphur Stone Co., Marion, O.
 Geo. B. Christian, Jr., White Sulphur Stone Co., Marion, O.
 Julius Martin, Ohio & Western Lime Co., Marion, O.
 W. D. Redrup, Whitehouse Stone Co., Whitehouse, O.
 A. N. McNeil, R. R. No. 6, Findlay, O.
 F. H. Molder, H. Molder & Sons, Rawson, O.
 A. O. Molder, H. Molder & Sons, Rawson, O.
 M. W. Sherwood, Jeffrey Manufacturing Co., Columbus, O.
 E. W. Pickard, Du Pont Powder Co., Pittsburgh, Pa.
 James K. Bruner, Macomber & Whyte Rope Co., Chicago.
 Fred K. Irvine, Rock Products, Chicago.
 J. S. Burton, Burton Powder Co., Chicago.

NOTES OF THE CONVENTION.

S. M. Hall had the most impressive visiting card that was ever seen on earth. It was about as big as his new automobile.

Allen Patterson, the energetic president, had another story which was duly introduced. It was almost as popular as Sally Adams, last year.

Piqua was well represented by L. V. Statler, A. Acton Hall and W. H. Loy, who has acquired an interest in that locality during the past year.

Judson, the Tarvia man, was on hand with his printed matter, and always ready to tell of the advantages of bituminous additions to road material.

C. L. Moore, the biggest man at the meeting, has organized the Lima Contractors' Supply Company and is right with the contractors on the firing line wherever he can be useful.

J. S. Burton, of the Burton Powder Company; Madison Whiteside, of the Aetna Powder Company, and O. W. Seigden, all dynamite men, were contributing their efforts to the comfort of the delegates.

Charles L. Ireland, the new president, has been one of the hard-working members for years. According to his past record, the stone club will have to do things every day or the president will be after them to find out why.

J. W. Weldon, of the France Company, is one of the energetic fellows who is looking for the future developments of the great stone and concrete industry which are now coming to the front to be the big money makers of the next few years.

Wire rope, that indispensable part of the quarry equipment, was represented by James K. Brunner, of the McComber & Whyte Rope Company, of Chicago, who distributed white pencils, and John K. Broderick, of the Broderick & Bascom Rope Company, of St. Louis, had watch fobs showing the yellow strand.

Lawson Moores, of Cincinnati, has got to be an automobile enthusiast and an expert at the same time. Lawson is one of the fellows who goes to the bottom of things to get all that there is to it. He is a firm believer in the policy of the stone club and is one of the working members.

The powder interests were well represented at the meeting. F. W. Pickard, manager of the Pittsburg branch of the E. I. du Pont de Nemours Powder Company, and P. N. Dennison, the Columbus representative of the same company, were constantly in evidence and pleasantly held up their end of the entertainment feature.

W. M. Frank, of the Troy Wagon Works, was on hand with booklets showing a train of Troy reversible bottom dump wagons being drawn by a traction engine, which was very interesting to the experienced road contractors, who realized that this meant an improvement which was not known in the days that are gone.

F. H. Angell, that genial entertainer and always-on-the-job member of the great Jeffrey interests at Columbus as the chief of their pulverizer department, was conspicuous by his absence. Practically every delegate asked the editor of ROCK PRODUCTS for Mr. Angell, and we were compelled to say that we were sorry Mr. Angell was out of town. However, his able assistant and W. W. Sherwood, representing the Jeffrey establishment, and Angell can easily square himself upon a future occasion, for both he and his pulverizer are most popular where they are best known.

Making Extensive Improvements.

CHICAGO, Ill., Feb. 21.—The Dolese & Shepard Company, who have recently put into operation the largest crushed rock plant in the country at Gary, Ill., are now making extensive improvements. These are under the supervision of the J. C. Buckbee Company, engineers, of Chicago.

Monster Crushing Rolls at McCook.

Wm. Woodhall, Jr., designing and construction engineer, reports that he has just finished his work on the equipment of the United States Quarry Co.'s plant near McCook, Ill., and that the big installation is moving along smoothly. This plant is equipped with the largest sized Edison rolls that have ever been built, as the initial crushing part of the equipment. It is said that pieces of rock half the size of a piano are fed to the rolls, and the only engineering feat of difficulty in connection with the output is to get enough material into the ponderous jaws. The other parts of the plant, consisting of the conveyors, screens and recrushing crushers, are complete in all details. There are quite a number of McCully and Gates crushers used in reducing the rock to the smaller sizes after it has passed the Edison rolls. The separating department of the plant has been built upon a very extensive scale with enormous bin capacity as well as outside storage. Mr. Woodhall is confident that a production of 5,000 tons a day will be easily and steadily sustained in the operation of the plant.

Big Crusher Plant at Racine.

RACINE, WIS., Feb. 21.—The J. O'Laughlin Stone Co. is preparing to build one of the largest stone crushing plants in the country at its quarries in Waukesha. This fact was disclosed by Mr. O'Laughlin, who stated that the demand for building stone had increased to a great extent during the past few years and had necessitated big improvements in both quarries.

Mr. O'Laughlin has invented a new principle of blasting stone which has revolutionized the industry and his system is being followed by every other large stone quarrying industry in the country. In place of the usual shallow drilled holes for placing the dynamite in the rock, Mr. O'Laughlin has discovered a system of drilling clear to the bottom of the quarry, a distance of over a hundred feet, burning out the bottom of the hole with high power dynamite, and placing therein a charge of powder. In this manner it is possible to break off thousands of yards of stone and at the same time crush the mass into small particles.

Dynamite Wrecks Quarry Plant.

TIFFIN, PA., Feb. 17.—Geo. A. Weot, president of the Bascom Stone Co., whose crusher and buildings were wrecked by the explosion of 1,200 pounds of dynamite last Saturday, states that the loss will aggregate \$10,000.

Tramps started a fire in the old office building at the quarry, where the explosive was stored, causing the place to catch fire. The buildings were blown to splinters by the explosion and an almost bare strip of ground marks the site of the quarry.

Changes in Quarry Equipment.

THORNTON, ILL., Feb. 20.—Important changes are being made in the quarry equipment of the Brownell

Improvement Company, of this place. The company have retained the J. C. Buckbee Company, of Chicago, for their engineers. The step of progress shown in the work consists of a new pumping apparatus which consists of a two-stage centrifugal pump of 1,500 gallons capacity per minute. This pump is driven by a rope drive on the main line shaft to the plant. The pump will displace three ordinary steam pumps formerly used for the purpose and will result in a huge saving in the cost of pumping. A suggestion is contained in this for a more economical system of pumping the water from quarries by the installation of a large pump. This is especially true where quarries have attained a great depth and where the water flows into the pit so rapidly.

Building Shows Slight Decrease in January.

Building operations in the leading cities of the country show a moderate decrease for January in comparison with the corresponding month a year ago. Permits were taken out during the month just closed in 59 cities, according to official reports to *Construction News*, for the construction of 10,059 buildings at an estimated cost of \$40,815,520, as against 10,730 buildings, involving \$43,137,377, for the corresponding month a year ago, a decrease of 671 buildings and \$2,315,857 or 5 per cent. This is a remarkably good showing when the long continued cold and the heavy snow is taken into consideration, in comparison with the open weather which has prevailed for many years. Nothing so seriously contracts building operations as severely cold weather and a heavy fall of snow. To those who are familiar with conditions the showing is in a sense far in excess of last year. The figures in detail are as follows:

City.	No. of Bldgs.	Est. Cost.	No. of Bldgs.	Est. Cost.	Percent Gain
New York (Manhattan and Bronx)...	179	\$9,218,950	284	\$10,441,800	*12
Chicago	482	6,054,300	689	8,227,700	*26
Philadelphia	563	2,131,775	733	1,677,025	26
Brooklyn	346	1,913,400	612	3,683,670	*41
Los Angeles	759	1,766,431	483	646,007	173
San Francisco	453	1,708,380	371	1,859,740	*8
St. Louis	427	1,461,000	475	1,124,219	21
Memphis	244	1,294,182	165	220,571	*47
Seattle	986	1,274,975	918	2,072,465	*38
Washington, D. C.	221	1,041,774	589	1,262,522	*18
Baltimore	221	980,969	217	370,360	164
Salt Lake City	30	897,400	42	375,150	139
Detroit	198	717,555	194	706,150	*10
Portland	339	624,110	170	431,415	45
Minneapolis	178	602,395	193	377,840	59
Pittsburg	126	576,925	207	684,614	*16
Kansas City	194	543,876	229	432,730	26
Newark	105	482,877	172	620,090	*22
Denver	127	449,300	234	694,475	*35
Houston	116	426,385	117	148,801	187
Buffalo	137	418,000	178	553,000	*26
Atlanta	332	406,377	320	585,799	*28
Dallas	165	380,565	151	204,695	86
St. Paul	184	354,592	105	285,576	24
New Orleans	144	309,915	366	297,780	4
Cincinnati	107	290,100	150	275,170	8
Oakland	232	297,082	184	557,770	*46
Rochester	120	290,646	215	215,964	35
Omaha	78	287,650	140	277,550	4
Cleveland	183	281,659	356	458,945	*28
Indianapolis	125	277,585	131	178,520	55
Louisville	86	271,956	121	132,830	105
San Antonio	319	199,151	204	307,895	*35
Milwaukee	81	180,195	126	238,541	*24
Cedar Rapids	15	177,000	11	51,200	246
Birmingham	183	169,848	107	220,090	*23
Sacramento	4	164,700	3	4,400	..
Norfolk	53	157,920	74	140,852	12
San Diego	114	152,150	80	147,600	5
Paterson	20	147,087	37	111,882	51
Tacoma	141	144,544	17	193,935	*42
St. Joseph	37	102,148	7	78,670	30
Binghamton	77	101,832	14	326,957	*68
Duluth	48	97,225	35	48,420	101
Toledo	34	84,760	55	110,127	*23
Mobile	24	84,220	25	38,650	118
Worcester	47	81,645	32	145,985	*44
Wilkes-Barre	36	70,324	30	64,090	10
Grand Rapids	46	68,876	61	98,340	*30
Columbus	38	67,265	83	120,338	*45
Des Moines	27	61,334	20	27,475	124
San Jose	41	49,040	41	100,711	*51
Stockton	18	33,600	7	25,740	31
Lincoln	16	27,925	35	60,400	*54
Topeka	20	25,000	21	34,350	*27
Davenport	9	22,100	4	11,100	99
Harrisburg	10	16,600	12	24,625	*53
Pueblo	6	6,275	18	24,450	*74
Totals	10,059	\$40,815,520	10,730	\$43,131,377

*Loss.

A consideration of the accompanying table presents a complex problem and is somewhat difficult of analysis because of the widely different condition prevailing in the principal cities. As for example, New York showing a loss of 12 per cent, Chicago 27, Brooklyn 41, Pittsburg 16, Buffalo 25, Cleveland 38, Milwaukee 24, Toledo 23; but there is nothing particularly startling in this, inasmuch as all of these cities have enjoyed unusual activity in building and there is no tangible reason in any one of them in so far as one can see for any let-up, but on the other hand the demand continues strong because of the high rents and the bright prospects for a continuation of this state of affairs for some time to come. Philadelphia shows a gain of 26 per cent, St. Louis 21, Portland 45, Minneapolis 59, Kansas City 26, Cincinnati 4, Omaha 4, Indianapolis 55 and Louisville 105, while other cities make remarkable gains, but it is upon such a small volume that the conditions are not comparable.

FROM OUR OWN CORRESPONDENTS

BUFFALO.

BUFFALO, N. Y., Feb. 20.—With the arrival of favorable weather there will be a resumption of barge canal activities which means the letting of many contracts. While the barge canal is a state undertaking, involving an expenditure estimated in the neighborhood of \$101,000,000, thus calling for unlimited quantities of cement and crushed stone, Buffalo cement manufacturers are chiefly interested in the contracts that are to be let for the western New York section of this artificial waterway that is believed to furnish the key to greater commercial fame for the Empire State and prevent the diversion of grain and freight transportation by way of the Canadian Welland canal route. No contracts of any importance have, as yet, been let for the barge canal for this spring, with reference to cement and crushed stone. The cement and crushed stone work is obtained on the sub-letting contract. Contracts for sections of the barge canal vary in size, each involving no less than a couple of million dollars, according to the section bid on. The contractor getting the contract then sublets out to other contractors for the several branches of work required. Many cement men have picked up some splendid contracts in this way.

So far as barge canal contracts, which were let some time ago and are now under way, are concerned, rapid progress is reported in this vicinity. For instance the contract between Pendleton, N. Y., and the Pendleton guard lock, a few miles from here, is being rushed. It is said that the entire rock bed in that part of the canal will be dug out before navigation is resumed on the canal in the spring. The Great Lakes Construction Company has contract No. 19. In connection with the entire barge canal contract New York State Engineer Frank M. Williams recently reported that at the end of 1909 there were 314.2 miles of canal under contract at prices aggregating \$54,138,329. Thus 76 per cent of the total length is under contract, and it is expected that the whole of it will be let by April, with the exception of some minor structures. Fifteen of the fifty-three new locks are now completed. By a year from next spring the eight movable dams in the Mohawk river will be in operation. The large fixed dam across the Mohawk near Crescent will be finished during the next summer, as will also the concrete dam impounding the waters of the upper Mohawk at Delta in a reservoir having a flooded area of 2,800 acres.

At the office of the Thorn Cement Company, in the Prudential building, Buffalo, the statement was made that the firm's business, while not in a state of dullness, was not notable for activity, owing to the prevalent inclement weather. Buffalo has not had such a tightly-closed, regular old-fashioned winter in many years. This winter has eclipsed its predecessors by a wide margin. There has been a superabundance of the beautiful, consequently the work has been light with all cement men. Prospects are good for spring work was the cheering information from the Thorn people. They expect some nice contracts on the barge canal work.

The Buffalo Cement Company is not so much interested in the barge canal contracts, judging from the statement obtained from Manager Schumacher's assistant. This office man said: "We are not so anxious after the barge canal work as we are for the good roads. We anticipate with the arrival of spring that there will be plenty of good roads work. You see we don't make cement any more, but the crushed stone is right in our line. We have some good contracts on hand, which will receive our prompt attention so soon as the weather grants us the desired permission to go ahead."

The Buffalo Sandstone Brick Company, of which W. E. Plummer, Jr., is secretary, reports business quiet for the present. It was reported at this office that a hustling spring was in sight with plenty of work to be cared for.

Plenty of activity is a feature of the trade of Reeb & Co., builders supplies, 599 Michigan street. This concern has been gradually forging ahead and has a big following in Buffalo and elsewhere.

Spring will also see the construction of many grade crossing viaducts and subways here. Arrangements are now under way between several large railroads and the municipality for the abolition of several prominent crossings at grade. This will furnish some work of value for the cement and crushed stone fraternity of Buffalo. At Black Rock, a Buffalo suburb, the

citizens want the city and railroads interested in the proposition to build a viaduct instead of a subway in connection with eliminating a dangerous crossing. At a meeting of the Buffalo Grade Crossing Commission Chief Engineer J. W. Pfau, of the New York Central, explained a subway plan that is satisfactory to the railroads. He said the subway would cost about \$900,000, whereas the viaduct would cost about \$1,200,000.

Cement and crushed stone dealers, general contractors and others will be interested in the report which reached Buffalo from Washington, D. C., on February 11. It is to the effect that the rivers and harbors committee, of which D. S. Alexander, of Buffalo, is chairman, has reported to the House of Representatives an appropriation bill in which is included more than \$1,000,000 for the improvement of Buffalo harbor and nearby waterways. The items for Buffalo improvements include: Black Rock harbor and channel, \$1,000,000; Buffalo harbor, removing Watson elevator site, \$62,205; Buffalo harbor, dredging, \$37,400; Niagara river, \$10,000; total, \$1,109,605. The appropriations also include: Charlotte, N. Y., harbor, \$40,000; Oswego, N. Y., harbor, \$125,000; Ogdensburg, N. Y., harbor, \$100,000; Erie, Pa., harbor, \$70,000. It is reported that a suitable appropriation will be made by the government in connection with the plan to deepen the Hudson river. This would provide for a depth of twelve feet at the lowest stage of water. This improvement is to furnish a suitable outlet for the New York state barge canal. It is reported that an important section of the canal will be opened before the close of navigation in 1914 and to have a sufficient channel for barges to pass without hindrance to the sea it is absolutely essential that work in the Hudson river begin in 1910. It is estimated that the total amount carried by the appropriation bill for government contracts in this and other parts of the United States is \$42,355,276—\$35,148,846 in immediately available cash and \$7,206,430 in continuing contract appropriations.

A plan to erect a mammoth convention hall on Broadway, Buffalo, is being considered by city officials.

Mosier & Summers, Buffalo contractors, will build a thirteen-story addition to the Statler hotel here. The cost will be nearly \$400,000.

According to a report from Welland, a Canadian town near here, Engineer McAllister, who was appointed to report on a new route for the Welland canal, from Selkirk, Ont., to Hamilton, Ont., has made his report. The plan appears altogether impracticable. The cost of such a route is estimated at \$84,000,000, which is four times the amount of the government estimate of the new Welland canal.

The International Waterways Commission, which frequently meets in Buffalo, has been considering the proposal made to dam the Long Sault Rapids on the St. Lawrence river near Brockville, Ont., for power purposes. The rapids are on the American side, but the proposition is to supply the power equally to both sides. The project would cost \$20,000,000.

It is reported that the work of abolishing grade crossings in Toronto, Ont., will be commenced by the Grand Trunk railway on May 1, and the first project to be undertaken will be the elimination of all level crossings from Bathurst street to the Humber river in that city at an estimated cost of \$2,000,000, of which the city's share will be about \$400,000.

The Hercules Waterproof Cement Company has filed papers of incorporation in Buffalo. The company is capitalized at \$100,000. The directors are Charles F. Peters, J. Louis Seligman, Henry C. Hutchinson, Charles Kuhn and Philip A. Sullivan, all of this city.

The Republic Engineering & Contracting Company has been organized in Buffalo. The company is capitalized for \$25,000. The corporation is to carry on a general contracting business. The directors' names are Frank G. Lane, William T. Lane, John W. Van Allen and W. C. Overman, of this city, and Elsear J. Proulx, of Philadelphia.

According to a report from Waverly, N. Y., S. C. Smith, a concrete contractor of that place, has just been granted a patent upon a device for holding forms for laying of concrete sidewalks, curbs, etc. A half interest in the patent is assigned to Mr. Smith's son and partner, Claude E. Smith.

In Montour Falls, N. Y., work has been commenced on the new building for the Hercules Concrete Pipe Company. The new company is composed of Fred Stockley, the patentee, and E. A. Dunham & Co.

It is reported that three concrete buildings will be erected at the plant of the United Industrial Fibre Company in Lockport, N. Y.

A public dock of concrete may be built at Dunkirk, N. Y.

The Bolivar-Wellsville Construction Company, of Bolivar, N. Y., has applied to the village trustees for a franchise to build and operate an electric railway line on Wellsville and Boss streets in that place. The proposed line is to connect Bolivar and Wellsville,

N. Y. It will be nineteen miles long and cost \$250,000.

The Buffalo Crushed Stone Company recently became members of the Buffalo Manufacturers' Club.

The taxpayers of Falconer, N. Y., near Jamestown, have voted in favor of a proposition to bond the municipality in the sum of \$60,000 for paving three streets.

Among the concerns incorporated recently in Binghamton, N. Y., was the Crossett & Lloyd Concrete Company, with a capital of \$20,000.

A drydock may be built at Sault Ste Marie. The total cost of the dock is given as \$538,576, with an additional \$100,000 for buildings and equipment.

Commissioner of Public Works Ward, of Buffalo, has been directed to prepare plans and specifications for paving Morgan street, in this city, with asphalt on a concrete base, forty-two feet wide from curb to curb, except between the rails of the street car tracks and two feet outside, to be paved with stone.

A report which reached here from Winnipeg says the Canadian Pacific is preparing to expend a huge sum, said to be \$30,000,000, upon construction and betterment work along that road in the West this season.

In Schenectady, N. Y., recently the Sandstone Brick Company secured the contract for 600,000 sand-lime bricks to be used in the construction of the county building there.

The Board of Contract and Supply of Binghamton, N. Y., has directed the city clerk in that city to advertise for bids to lay concrete sidewalks on the Court and Exchange street bridges there. Test panels will first be laid on both bridges to determine the quality of the work.

BALTIMORE.

Baltimore, Md., Feb. 17.—With an immense amount of work already in progress and thousands of dollars' worth contemplated local cement dealers are anticipating a general improvement in the market conditions, including an increase in prices. For several months the market in this vicinity has been somewhat demoralized on account of the cutting in prices by the smaller dealers and as a result there has just been one continuous battle among the dealers.

Members of the firm of the Security Lime & Cement Company, of which Harry Warner is secretary, have reported unfavorable conditions for some time, but they say there is a bright outlook with the opening of the spring. The new plant being erected by that concern will be ready before many more months and when the output starts to move there will be increased business in this city. Work of constructing the new plant is being rushed as fast as possible and it is hoped the contractors will finish it sooner than was at first expected.

Some important improvements have been contemplated for the coming year which will amount to an expenditure of between \$3,000,000 and \$4,000,000. Among them will be the new Emerson Hotel to be erected at the northwest corner of Baltimore and Calvert Streets for Dr. Isaac E. Emerson, the new fifteen-story office and newspaper building to be erected by Frank A. Munsey for the *Baltimore News*, the new addition to the Fidelity Building at the corner of Charles and Lexington Streets and the new Union Station of the Pennsylvania railroad.

All of the proposed structures will be fireproof and plans have been finished by some of the leading architects in the country. The new Munsey building will be located on the site of the present *Baltimore News* structure at the southeast corner of Fayette and Calvert Streets and when completed will be the largest office building in the city. It will cost about \$1,000,000.

Actual work on the new Union station has already begun and will be rushed to completion as soon as possible. The building will be a fireproof structure and considerable quantities of stone, cement and steel will be used in the construction.

A number of building operations by the Roland Park Company recently has attracted the attention of the cement and stone dealers inasmuch as most of the houses erected have been of fireproof construction. Such houses are something new for this city and they have proven popular as well as profitable. The houses are built in Roland Park, which is the most fashionable section of the city and in very few instances are they inexpensive structures. In most cases the smallest house does not cost less than \$8,000. Most of them cost as much as \$20,000 and \$30,000 each. Edward L. Palmer, Jr., is the architect who is planning most of the houses and he has several other plans under way now.

ROCK PRODUCTS

CLEVELAND.

CLEVELAND, O., Feb. 20.—Although the past month has not been a good one for those engaged in the building industry, many projects are framing up in good shape and will be started just as soon as weather conditions will permit. The year promises to be one of the best in the history of the city, and the manufacturers and supply men are getting ready to meet a big demand for building materials.

That cement is going to play an important part in the building operations of the coming season is already apparent from the type of construction for which plans are being drawn. The main operations will center on a number of skyscraper office structures, a huge rink and exposition hall, several public buildings of considerable magnitude and the elimination of railroad crossings by the building of concrete bridges and embankment walls.

A building permit has been secured for the new eight-story concrete building on East Fourth street for the Tenbusch Realty Company. It will be the second structure of that height in Cleveland, as the code was but recently revised allowing that height. The general contract for the reinforced concrete frame has been let to the F. P. Construction Co. Work on tearing down the old buildings on the site is now in progress. The building is to be finished by next fall.

An important building contract let during the past month was for the addition to the Rockefeller building, which is to cost nearly \$700,000. It will be sixteen stories high, with a frontage of 63 feet and a depth of about 150 feet. The general contract is to be executed by the Thompson Starrett Co., of New York City. It calls for the completion of the big structure by Oct. 1 and promises to be a record breaking job. The framework is to be of steel, heavily reinforced with concrete. Floors are to be fireproof and wall panels of brick. A four-story hotel building on the site is being ripped down to make way for foundations for the addition. All interior halls are to be of white marble.

A new technical high school costing \$250,000 or \$300,000 is to be built on the West Side. The sum of \$50,000 has just been spent on a twelve-acre site, and plans for the building are being prepared in the office of the school architect, F. S. Barnum. Work is to start as soon as contracts can be let this spring. Four grammar schools, costing about \$100,000 apiece, are now being planned. Contracts are to be let soon. They are to be known as the East Denison, the Tremont, the Boulevard and the Central schools. They will all be of brick, concrete and tile and will be strictly fireproof. Next year six or eight schools of a similar character must be built to keep up with the school growth.

Contracts are about to be let for a new theater to be known as the Priscilla, and to be located on East Ninth street and Chestnut avenue. It is to be of an ironspot white brick steel frame, heavily reinforced with concrete. The building is to have a frontage of 64 feet and a depth of 115 feet. Work on the excavation is now in progress. Considerable ornamental terra cotta is to be used in the decorative scheme which is to be followed. Architect George A. Griobel has prepared the plans for the structure.

Considerable interest attends the announcement that the Lake Shore Railroad is to spend \$15,000,000 in improvements in the Cleveland district. The sum of \$95,000 has been allotted for a new passenger and freight depot at East 105th street, and \$96,000 for a new freight station at Watson street. The Collinwood shops are to be enlarged and repaired at a cost of some \$75,000; a new concrete bridge is to be built over the Grand River at Painesville, at a cost of \$52,000, and a new bridge over Neff Road, Cleveland, at a cost of \$75,000. Plans for these improvements are in the hands of the road's own engineers, but they will call for a huge amount of cement and materials in their execution.

W. H. Sutliff, for several years representative of the Trussed Concrete Steel Co. here, has severed his connection with that firm and is now associated with Bolton & Pratt, concrete erectors and general contractors. He will have charge of the estimating and engineering department for Bolton & Pratt.

The Hunkin Brothers Construction Co., which has erected some of the largest concrete buildings in Cleveland, has changed its name to the Hunkin-Conkey Co., taking G. E. Conkey into active partnership. Mr. Conkey has been associated with the concern for a number of years and has been one of its active spirits.

W. H. Hunt has retired from the Hunt-Quisser-Bliss Co., dealers in builders' supplies, as he has become head of the Cleveland Life Insurance Co. The concern will hereafter be known as the Quisser-Bliss Co. Mr. Hunt has been named as honorary member of the Builders' Exchange, an honor awarded to only three other persons.

Another supply company which has been incorporated during the past month has been the Lake Erie Builders' Supply Co. Its incorporators are W. C.

Runyon, R. B. Ellis, J. J. Rowe, W. A. Fay and John Schaeuer. W. A. Fay is manager of the new concern. He was formerly manager of the Masons Supply Co. and later of the Cleveland Builders' Supply Co.

The B. F. Goodrich Rubber Co., of Akron, has appropriated the sum of \$1,000,000 for new buildings this year. Several new six story fireproof factory buildings are being planned.

Williams Brothers & Morse, of Cleveland, have been awarded an important contract for the retaining walls of the barge canal at Ft. Edwards, fifty miles north of Albany, N. Y. The contract is for \$250,000, and a total length of 1,180 feet. It will require 21,700 yards of concrete. Work is to start on the contract on May 25.

THE WEST COAST.

SAN FRANCISCO, CAL., February 18.—Building operations in San Francisco have been at a minimum during the month of January. The figures for the building permits issued during January were \$1,170,000, as compared with the December figure of \$1,938,561, but what San Francisco lost during the month was gained by Los Angeles, which had a figure of \$1,766,150 for building permits for the same time. This is the first time that the Los Angeles record has ever surpassed that of San Francisco.

The concrete men expect a record year in their business. The year has started out well, with a strong demand for cement from the small towns and the country districts. Many inquiries are being made for cement by prospective builders in this city, and if the business in prospect materializes there will be many concrete buildings going up in San Francisco during the spring. A few contracts for buildings of concrete construction have already been awarded, among which are the following: The Polk Street Improvement Company's new market at Sutter and Polk streets, to the Ransome Concrete Construction Company; the Hearst Building, with concrete floors, cement finishing, piers, walls and pits, to Peterson, Nelson & Co., and the ten reinforced concrete buildings of the Santa Clara College, which was destroyed by fire a short time ago. The cement plants are expecting a rush of business during the spring which will tax their utmost capacity and are now preparing for it in remodeling the buildings, enlarging the capacities and installing new machinery.

Callahan & Manetta, contracting plasterers, have been kept very busy during the past month on a number of large jobs of plain and decorative plastering. Among some of the recent jobs done by the company are the decorative work for the new Orpheum Theater, the Mercantile Trust Company Building, the Elks Building, the Spreckels Building, the Berkeley National Bank Building, and a score of others.

The Western Stone Company is cleaning up the stock of natural stone with the intention of going out of the granite and marble business. When the present plans of the management are complete the company will devote itself exclusively to concrete and stone mantel work. The reason assigned for this change is that there is not enough business for all the existing companies, as the price of granite for building purposes restricts the investors who wish to gain an ample return from their money. The business in granite thus is confined mostly to public buildings, while the office buildings use some other material, or to get the effect of the natural use the concrete. The company has been awarded the contract for building the Southern Pacific railroad depot in Seattle. The contracts calls for 20,000 cubic feet of concrete.

The E. B. & A. L. Stone Company are altering the rock-crushing plant at Santa Cruz, Cal., and making extensive repairs for the enlargement of the capacity in order to meet the demands of the business, which are expected to go far beyond last season.

The Cowell Portland Cement Company is doing a good country business at the present time, but the demands of the trade are expected to shift to the larger cities at the beginning of the spring building activity.

The Mastic Paving Company has been incorporated in San Francisco with a capital stock of \$10,000 by R. R. Womach, H. A. Lean and S. H. Austin.

The Standard Portland Cement Company, of Vallejo, Cal., which has been undergoing repairs for the past several weeks, has landed a 50,000 barrel cement contract for the state penitentiary at Folsom. The cement will be used in the construction of a new prison wall and for an asylum for the criminally insane.

The Davenport Cement mill at Santa Cruz, Cal., has resumed work with about 500 men, after a shutdown of one month. The mill has plenty of orders ahead and the prospects are bright for a good year.

George Reilly of Santa Rosa, Cal., is manufacturing a large lot of 20-inch cement sewer pipe for the city.

The County Commissioners, of Everett, Wash., have planned the installation of a rock-crushing plant to cost \$12,000 to replace the small machine at the base of the Iron Mountains.

The San Diego Reinforced Concrete Company, of

San Diego, Cal., has planned the construction of a concrete wharf to cost \$40,000, carrying double trackage surface, and a three-story warehouse adjoining for the shipment of the product to better advantage to the Northwest.

The city of Tacoma, Wash., has awarded the contract for the construction of a reinforced concrete bridge on Puyallup avenue to A. U. Mills for \$89,500, and sidewalk construction to Wright & Sweeny.

The Portland Sand Company, of Portland, Ore., has been incorporated for \$25,000 by A. L. Carson, A. Giebisch and A. T. Lewis.

The Kingstone Ornamental and Construction Company has sold its quarries near Van Trigger, San Bernardino County, Cal., to the Golden State Realty Company. The Realty Company will reincorporate for \$1,000,000 and will build a spur track from the railroad to the quarry. Upon the completion of the railroad line a rock crusher is to be installed and other improvements in the plant are to be made. The Kingstone Ornamental Company has the contract to market the output of the quarry.

BIRMINGHAM.

BIRMINGHAM, ALA., Feb. 18.—Although this is the worst season of the year for the building trade, and while no very big contracts have been filled by any of the dealers, they are kept busy with small orders and are steering very successfully through the gloomiest part of the year.

As the beginning of the new season approaches nearer and nearer, bright dreams of future prosperity loom up in the minds of the people in the trade; and, indeed, they are well justified, as this promises to be one of the greatest record breaking years in the history of this city.

The Birmingham Sand & Brick Co. states that business is at the medium mark and consists mostly of small sales of material.

The Southern Bitulithic Co. has removed its plant to Meridian, Miss., after many delays caused by work in this city.

Mr. Walker, of the Carolina Portland Cement Co., reports business good, considering the season. Among the sales worthy of mention is the monthly 2,000 barrels of cement used by the Tennessee Coal & Iron Co.

It is announced that the L. & N. Railroad Co. will erect a shop at Boyles, at a cost of several hundred thousand dollars.

The city council has passed ordinances providing for the paving with brick of Fourteenth, Fifteenth, Sixteenth and Seventeenth streets from Second to Fourth avenues. On the day of the passing of these bills, a committee of citizens appeared before the aldermen and protested strenuously against the paving of South Eighteenth street, from Avenues A to K, with brick. In order that the people affected may have more time to consider materials, the passing of the last-named ordinance was deferred.

The Tennessee Coal & Iron Co. will erect a giant dam at Ensley, and is open for bids on the 60,000 barrels of cement to be used in its construction.

The Dun & Lallande Brothers Contracting Co. have had a prosperous month. They have just received the contract for the erection of a sewer system in the town of Carltonsville, Ga.

The Standard Portland Cement Co. has furnished 14,000 barrels of cement to be used in the erection of the new postoffice building in Atlanta, Ga.

The Brownell Mantel & Tile Co. has done a very creditable amount of work this month, the tiling of the postoffice at Florence, Ala., being especially worthy of mention. The firm will move its place of business from its present location to 316 North Twenty-first street, where it will occupy a more spacious building.

The Birmingham Supply Company has furnished the material for the roofing of the plant of the Southern Iron Foundry Co., at Gadsden, Ala.

Building activity during the past month was steady according to the report of W. O. Mathews, the local building inspector. While actual work was not started on anything in the way of a large structure, many announcements of big buildings have been made. The Y. M. C. A. will soon begin the work of erecting its new \$200,000 home, while Steiner Brothers announce that they will put up two business buildings on First avenue, and Armour & Co. state that they will build a large storage plant.

The management of the Birmingham Baseball Association will erect this year a tremendous concrete grandstand at the ball park, having discovered after investigation that the modern concrete structures are more lasting and stronger than the old fashioned stands of wood. Upon completion this will be the first concrete grandstand in the South.

Much interest is being displayed in the question as to whether or not architects should be admitted as members to the local Building Material Men's Association. A decision will be reached at the next meeting.

LOUISVILLE.

LOUISVILLE, KY., February 20.—No previous year has ever opened with prospects such as Louisville and the entire state of Kentucky shows this early for 1910. Building permits for the month of January, while only numbering 88 all told, showed a total value of \$271,956, against \$132,830 for January of 1909 and \$71,961 for January, 1908. These two years show 121 and 135 permits respectively. It is evident in this, that, while the number of permits fell far short of the number in the two preceding years, that the work that will be done this year will be on a much larger and costlier scale. It will easily be seen that January of 1910, with only 88 permits, is almost four times as great in the amount of money spent on the 135 permits that were issued in the same month two years ago.

The Louisville Water Company will probably spend many thousand dollars this year making alterations and improvements necessary to the installation of a 30,000,000-gallon pump at station No. 1; the construction of a concrete and stone in-take crib and tower, with concrete chambers; construction of Weir tower, and improvements to conduit; new stables and additions to buildings on Third street and better provision for the storage of coal. Former Mayor Charles F. Grainger is the new president of the water company, and, as it is known that he is in favor of the above-named improvements, it is very probable that no time will be lost in making them. During the last year more than twelve miles of pipe were laid, and the filter work brought to a successful end.

The Central Concrete Construction Co., are now working on the big contract that they have at Cave Hill Cemetery. It is a wall surrounding the grounds, with concrete base and a concrete coping with brick between. Mr. Wintersmith stated that inquiries were coming in rapidly, and he considered the prospects excellent.

Mr. Struck, of the Alfred Struck Co., said that the jobs that they were working on now were mostly those that were held over from last year, or small ones. Their out-of-town work is keeping them very busy and they do not expect to do much in Louisville before the first of March.

The paving business will be the specialty of the American Construction Co. this year. The large number of contracts that the city will let out appeals to Mr. Graham, and he expects to get his share of the work, with the proviso that he can get it at a price that will make the firm some money. Mr. Graham is very enthusiastic on the subject of the new Concrete Contractors Association, of Louisville, Ky., which has been organized since last writing. The president is P. S. Hudson; vice-president, F. W. Graham, and J. M. Vollmer, secretary of the Builders Exchange, is acting secretary until a thorough organization is completed. Practically all of the concrete men are members, and weekly meetings have been inaugurated. The purposes of the association are to promote the concrete business and the welfare of those engaged in that line, and an effort will be made to overcome the prejudices of the public in general toward concrete as a structural substance. According to Mr. Vollmer, secretary pro tem, a national body is the end desired, and they hope for such in the near future.

H. S. Gray, manager of J. B. Speed & Co., has just returned from a business trip to Chicago and the South. He is looking for a healthy increase in the business and at present they are kept busy part of their time on the Avery plant in South Louisville, where they are shipping a carload of cement a day.

The National Concrete Construction Co. had their office force working full speed at the time your correspondent called on them. J. B. Ohligschlager, the president of the company, said that according to the architects it will be thirty or sixty days before the work begins in earnest, but their prospects were never better than they are for this year.

Mr. Wheat, of the Utica Lime Co., said that all that was delaying them is the unsettled condition of the weather. He expects Portland cement to raise in price in the near future, and is well pleased with the prospects for a big season.

The Southern Wall Plaster Co. have their plant running steadily and expect good prices for the year.

The cold weather and ice in the river has prevented any operations at all on the part of the Ohio River Sand Company, so that they are practically at a standstill just now. They are preparing to take advantage of the first open weather.

The Southern Brick & Tile Company started their plant on the Southern railroad last week.

Mr. Burrell, of the Burrell Sewer Pipe Company, said that there is practically nothing doing at present. He said that all that he was afraid of is the prospects of a strike that promises to come with open weather. High prices of food and low wages are given as the causes for the proposed strike, but Mr. Burrell is of the opinion that the attention of the laborers should be called to the fact that while wages are not of the best, at the same time an increase in

those wages will mean less chance for the employers in securing contracts that they bid on, consequently this would in many cases mean fewer days work at the higher prices.

The Ingram Roofing Company are well pleased with the business conditions and prospects. J. H. Ingram said that during other years at this time they were waiting for fine weather, or rather that was the excuse that was given by everyone that was proposing to build, but that this year they are actually doing business, inquiries and orders coming in steadily.

A building permit was taken out on February 10 by the Snead Manufacturing Company, of this city, for the erection of the big Power building on Market street, between Eighth and Ninth, at a cost of \$120,000. D. X. Murphy & Bro., are the architects, who have awarded the contract for the erection of the building to the firm of A. Bentley & Sons, of Toledo, Ohio. The building, which will cost in the neighborhood of \$200,000 when completed, will be 184'x90' and eight stories high. The material used will be reinforced concrete throughout, and the building will be of the "Mushroom Type" of construction. The ceilings will be unbroken by beams, as the slab will be supported at its four corners by columns.

A concrete stable will be one of the features of city work for this year. Recent investigations on the part of committees appointed by both the council and aldermen show the miserable conditions of the city stables and conditions most unhealthy for the stock therein. A lot will be bought on Jefferson street, between Eighth and Ninth streets, according to a resolution that has already passed the upper board of the General Council and which will go through the lower body this week.

The Kentucky & Indiana Bridge Company, which is owned by three railroads, will in all probability build a new bridge, to take the place of the one that was built over twenty years ago to handle traffic much lighter than the railroads are now having. It is understood that estimates on the work have been forwarded to the directors of the different roads.

Representative Linn has introduced a bill for the General Assembly appropriating \$60,000 for roadways, walks, sewer system and additions to the buildings of the State University at Lexington, \$45,000 for the same improvements at the Eastern Normal School at Richmond and \$75,000 for the Western Normal School at Bowling Green.

The Henderson Bridge Company has filed articles of incorporation at Frankfort, Ky., with a capital stock of \$1,500,000. The object of the company is to construct a bridge across the Ohio river from Vanderburg County, near Green River Island, for the use of railroads, traction cars and vehicles.

Work on the big new hotel in Lexington, which is to be called The Milton, in honor of Col. Milton Young, will begin within the next thirty days. The company, headed by Colonel Young, is capitalized at \$300,000, and plans have already been drawn, but not definitely accepted. The structure will be fireproof, six stories in height and be 150'x250'. The company expects to have it completed by next winter.

Articles of incorporation have been filed at Frankfort by the following: Jacob Stengel Company, of Louisville; capital stock \$5,000; to own, operate, buy and sell stone quarries and lands, rock crushers, etc. The capital is divided into shares of \$50 each and the limit of debt \$10,000. Jacob Stengel owns ninety-two shares, Urban J. Stengel five shares and Charles Stengel three shares.

The Bituminous Rock Products Company, Owensboro; capital stock \$200,000; incorporators, J. Stanton Cottrell, S. Lambert and J. H. Hickman; buying land having on it asphaltum rock, beds or deposits of asphaltum, granite rock, etc.

The Lexington Crushed Stone Company, Lexington, Ky.; capital \$1,500; incorporators, Ed. Lenahan, Cullen Crewes and T. V. Forman; sale and delivery of crushed stone.

After litigation covering a period of two years the suits against the General Supply & Construction Company, which built the new capitol at Frankfort, were compromised and settled January 28. By the terms of the agreement those creditors who had liens received 60 cents on the dollar.

E. B. Shiffey, former city engineer of Owensboro, Ky., has gone to Washington, where he will urge his claim for patent rights on a concrete barge, of which he is the inventor. The contracting firm of G. A. Whitehead & Co. are using a barge of this kind in handling sand and gravel and it is proving valuable.

As was expected, Mayor Head reappointed the old commissioners of the sewerage system and will allow them to finish the work that they began actively March 17, 1908. There is still a big portion of the work to be carried out, and it will be pushed forward rapidly. The southern outfall, which cost \$1,250,000, will be finished this coming summer, and other contracts, about 37 in all, amounting to about \$1,200,000, are being executed. The work on the entire system is expected to be completed early in 1912.

NASHVILLE AND THE SOUTHEAST.

NASHVILLE, TENN., Feb. 17.—Quite a little work is being outlined here for the spring, but owing to bad weather it is quiet now. The money will soon be forthcoming for the Peabody College for which Tennessee, Nashville and Davidson counties joined hands. This is more than a million and will probably give some impetus to the building trade. The Hermitage Hotel is almost finished.

W. T. Hardison, of W. T. Hardison & Co., sand and supply dealers, stated that trade was very good for the season and that the spring outlook was even better.

The Nashville Builders' Supply Company is making some nice contracts with reference to the cement, lime and general buildings to go up in the next few months.

The Rock City Concrete Co., 324 Deaderick street, has been building a large sewer for the city on the Gallatin Road in Eastland. Dixie cement was used on this job.

Cooper & Ferguson, plastering contractors, Deaderick street, have considerable work in prospect as soon as weather conditions permit. H. S. Cooper, of the firm, is meanwhile taking a much needed vacation in Florida.

Cunniff & Stone, Cole Building, are meeting with success on local and out-of-town contracts. They are just finishing a concrete paving job at Carthage, Tenn. They have other work at Red Boiling Springs. They were the lowest bidders for laying pipe across the Cumberland River bridge. They have a quarry of their own here in the city where they are crushing limestone.

The Oman Stone Company in South Nashville were visited by your correspondent. This firm is now doing considerable concrete and paving work in addition to their cut stone business. They did a large amount of the latter work in the East last year and in the concrete and crushed stone department they have some work on the string in West Tennessee.

The secretary of the Nashville Builders' Exchange is getting out a new directory of the membership in that body and formulating some new rules and work that count for something and are much appreciated by local building people. The exchange has more convenient quarters now in the Noel Block.

The Foster-Creighton-Gould Company will superintend the work on the Masonic Temple to be erected corner of McGavock and 7th avenue. The temple is to cost \$150,000 and will be constructed of stone, light brick and terra cotta, with reinforced concrete floors. The exterior of the building will be of stone.

The Newsom Crushed Stone & Quarry Company, Vanderbilt Building, who have built more concrete block houses than any firm here, say that developments promise to be alright this spring. They are selling crushed stone over a wide territory and recently landed some nice work in Memphis and Shelby counties.

The Uncle Hiram Roofing Company of this city has several paving and roofing contracts on hand into which concrete will enter and which will be started as soon as the weather permits.

W. T. Causey & Brother have been given the contract to build a bungalow for John J. Heffin, on Belmont Heights. A. H. Ewing is having a fine bungalow erected at Franklin, Tenn., after plans by Architect Thomas Marr, of this city.

Maj. C. T. Cheek, of this city, will erect a handsome residence on West End avenue, after plans by Architect C. A. Ferguson. The cost will be about \$35,000.

Architect R. H. Hunt, of Chattanooga, was here recently. He has completed plans for the twelve-story building to be erected by the Hamilton National Bank, that city. Mr. Hunt also recently drew plans for the James Hotel, that city. It will be nine stories in height and cost upwards of \$400,000.

J. Pierpont Morgan has donated \$50,000 to the University of the South at Sewanee, Tenn., to be used in the construction of a Mechanics and Arts building. This swells the fund to \$500,000. The donations of both Mr. Morgan and Mr. Carnegie will be announced officially in a short time.

Murfreesboro, Tenn.

The site was selected here last week for the Middle Tennessee Normal School to be built by the State at a cost of about \$75,000. The matter is contingent on a bond issue and the case will go through the Supreme Court first, but the law will probably be sustained as no special irregularities are known with its passage. The test is regarded as a formality.

Huntingdon, Tenn.

J. B. D. Woodyard has the contract for a brick building for Lon Vawters here. The First Methodist Church is erecting a new edifice of brick. J. W. Patrick is the building supply dealer here and is enjoying a good business.

KANSAS CITY.

KANSAS CITY, Mo., Feb. 20.—The building weather was of an extremely fine quality in Kansas City during the month of January, and to the present time in February, the bad days being the exception to the general rule. The building operations delayed throughout the month of December and early part of January have been pushed forward rapidly and are now probably about as far towards completion as the contractors had expected at this time of year, for the delay in December was made up for in January, when the delays are expected. Of course, there was this difference—the contractors figured on bad weather in January and would have had their buildings well enclosed by that time, so the inside operations could go forward in the bad weather, and so these operations will now continue in February instead of January.

There has been a steady demand for cement during the past month, but it has been light, of course, as this is not a cement time of the year. A good deal of it has been going south, however, where cement work is progressing as usual, winter as well as summer.

Robert M. Campbell, who has been city passenger agent of the C. & A. Railroad at this point, has resigned and will take a position with the Southwest Terra Cotta Co., of Bartlesville, Okla., which maintains its general office in this city, in the Finance Building.

The announcement comes from St. Louis, Mo., that Geo. E. Nicholson, president of the Iola Portland Cement Co., is to marry Mrs. Ida H. Anderson, of that city, next June.

The county commissioners of Wyandotte county, Kansas, have authorized the expenditure of \$2,000 for the purpose of building an arch concrete culvert over Muncie Creek, on the Reidy road. This will be the eighth concrete culvert built in the county.

The Ash Grove Lime & Portland Cement Co. has established a fellowship at the University of Kansas for the purpose of making researches in the methods of manufacture and use of lime and cement.

The Towl Engineering Co., which has maintained headquarters in Omaha, Neb., for several years, has opened a branch office in this city, at 410-Orear-Leslie building. G. S. Martindale is manager of this office and W. J. Brown is resident engineer.

The Missouri Pacific Railway Co. will put in a reinforced concrete viaduct in Independence, Mo., where the tracks cross South Main Street.

The Herring-Hall-Marvin Safe Co. is putting in a concrete vault in the building at 1001-1003 Main Street. William Krames is the contractor for the job.

The Board of Water Works trustees will let the contract for a concrete settling basin and head house to be erected at their plant in Quindaro, Kan.

The city is about to let the contract for an 80-foot span reinforced concrete and steel bridge, to be 20 feet wide and 4-foot walk, to be located on Fillmore Street, where it crosses Shunganunga Creek.

The Milwaukee Corrugating Co. has leased the southwest corner of Eighth and Madison, and will erect thereon a two-story concrete building.

Plans are now being prepared for a sewer system for the Brush Creek Valley in this city, beginning at Summit Street and running to Jackson, for the present, and later to be extended to the Blue Valley, where a large sewer is to be built to the Missouri River. The specifications on the smaller parts of this sewer call for either clay pipe or concrete pipe.

S. D. Crozier has been appointed general sales manager for the Monarch Portland Cement Co. He is a salesman of wide experience in the lumber field, having been with the Chicago Lumber & Coal Co. and later with the Rock Island Sash & Door Works. He has appointed Edward F. Levy, who was formerly with the Iola Portland Cement Co., as salesman for the Kansas City territory.

Joseph A. Bartles, president of the Commercial Club of Dewey, Okla., was a recent visitor to this city, consulting with Kansas City men with a view to the establishment of a large terra cotta plant at that point. He states that the population of Dewey has been doubled since the establishment of the plant of the Dewey Portland Cement Co., and it is his opinion that the establishment of this terra cotta plant will cause history to repeat itself.

A good deal of work is now being done by both the cement and lime companies in the way of trying to induce the dealers throughout the country to stock up on their product, so they will be prepared for the big demand when it comes, and this work is bearing fruit, though not as readily as it should. The retail trade seems to feel that the manufacturer is trying to get rid of stock by placing it with them before they need it, when in fact the manufacturer is right. What he wants is not to overstock the retailer, but to be sure the retailer will be able to supply every demand made upon him,

and thus avoid losing any business. They know that after the spring rush opens there will be a good many retailers out of stock and they will be howling for quick delivery at the time when cars are hard to get, and only a certain number can be loaded each day, and then the railroads will be slow in delivery, while the dealer can order now, and even if the railroads are slow in delivery, it will make no difference, and the stock will be in the warehouse and ready for delivery when called for instead of coming to the dealer when he has more business than he can well take care of. The manufacturer puts it this way: "A great many of our customers are handling lumber, implements, hardware, seed, etc., as well as lime, cement and other building material. There is a rush in many of these lines in the spring, carloads of goods are coming in rapidly and must be unloaded and taken care of at once to stop demurrage on the cars and at the same time the heavy business of the year taken care of by the sales force. This means a considerable expense for hired help to unload the arriving goods and house them which could be saved to the retailer if he had the goods come to him before the rush season was at hand, as the regular force could then do the work while it would otherwise be doing very little. Then he has everything at hand so the orders can be quickly filled, thus reducing the work of the selling force, because it is easier to fill an order when the house is not filled with freshly arriving goods than if the floor is covered with them."

"We want our customers to be able to fill their orders promptly, as that causes our product to sell instead of the product of some rival plant which is handled by a rival dealer, and that is the reason we are now urging our retailers to buy early and always be sure to have plenty in their warehouses," said a prominent cement manufacturer.

A stadium company has just been incorporated in this city with a capital stock of \$150,000, to build a stadium to accommodate the big football games of this section of the country, and such sports, and it is now their intention to build a solid concrete stadium with a capacity of some 15,000 to 20,000 people. The enterprise has the backing of both the Missouri and Kansas universities, and it is probable that the enterprise will be pushed through at an early date, so everything will be in readiness for use in the coming fall.

PHILADELPHIA.

PHILADELPHIA, Pa., Feb. 19.—Portland cement trade is a little quiet this month owing to the continuing freezing weather, but the outlook is very promising. Prices remain firm.

Charles Warner, of the Charles Warner Company, dealers and manufacturers of cement and "Limoid," states that all their plants in Pennsylvania are in operation and that they are making very extensive additions to their southern plants, increasing their capacity.

Philip S. Vollmer, of the Atlas Portland Cement Company, states that the outlook is very good and prices remain firm, with every indication of an early advance. Among their contracts, they are furnishing Atlas Portland cement in the construction of the new buildings of the Eastern Penitentiary at Philadelphia.

Robert W. Lesley, president of the American Cement Company, states that they have been somewhat surprised at the good business coming in at this season of the year, and is very confident that this year's business will be excellent.

John G. Brown is preparing plans for a six-story concrete warehouse to be erected at 919-21 Arch street. Estimated cost, \$55,000.

E. Allen Wilson is preparing plans for twenty-nine three-story stores and dwellings at Kensington avenue and Westmoreland street.

A large new coal warehouse will be erected at Ninth and Thompson streets by Walter T. Bradley Company. It will be of concrete and steel construction 180'x58'. Architect, Henry J. Blauvelt. Estimated cost, \$25,000.

Plans are being prepared by Dr. Paul Phillippe Cret, professor of design, for a separate building for the School of Architecture of the University of Pennsylvania. The building is to be a three-story structure modeled after the style of the Italian renaissance and will cost about \$250,000.

James G. Doak & Company have posted plans for the new twenty-story hotel building at 1229 to 1235 Chestnut street. The plans were designed by Watson & Huckel, providing for a structure of steel and reinforced concrete fireproof construction. The building will be of imposing design in the modern French style, the first floors being of marble. Estimated cost, \$1,000,000.

M. P. Murphy has been awarded the contract for the modern fireproof apartment house, with stores on the first floor to be built at Ardmore, Pa. Estimated cost, \$25,000.

MEMPHIS AND THE SOUTHWEST.

MEMPHIS, Tenn., Feb. 17.—Outlook good, prices firm, winter activity above the average is what Rock Products' correspondent hears from Memphis building supply firms and contractors. While the weather has been very severe here the last month and while the register is twenty above zero with a sleet and snow on the ground at this time, yet the local situation has some zest to it. The two skyscrapers are being pushed forward, the concrete loft building is looming up and it is declared that work on the Union Station will start by April 1, and on the West Tennessee Normal School a little later. The cement market shows no additional strength to boast about, but lime, sand and other articles are the subject of wide correspondence in this territory.

An interesting election for 1910 has just been held this month by the Builders' Exchange of Memphis. The contest was in the main a victory for ticket "B," only two names from ticket "A" landing. The result was as follows: L. T. Lindsey, president; W. T. Hudson first vice-president; C. E. Metcalf, second vice-president; R. E. Montgomery, treasurer; directors, D. M. Crawford, C. W. Holmes, J. E. Faires, G. I. Drew and J. W. Tatum.

A meeting has been held here at the office of President J. L. Lancaster, of the Memphis Union Station Co., attended by Chief Engineer M. L. Lynch, of the Cotton Belt; W. H. Courtenay, of the Louisville & Nashville and other lines. It was practically assured that work will start April 1. The site is now almost cleared. It is settled also that the Frisco will enter.

Architect W. J. Hanker, of Hanker & Cairns, Scimitar Building, states that the outlook is very good in all lines of construction work for the spring and summer. Mr. Hanker is impressed with the idea that there will be much concrete and reinforced concrete work done.

Charles R. Miller, of the Charles R. Miller Co., has much work on hand. He is putting in a reinforced concrete floor in addition to the retail store of B. Lowenstein & Brothers, the largest dry goods house here. He also is doing jobs for H. T. Bruce, R. T. Cooper, E. W. Porter and others.

Olson & Lesh, Royal Building, are busy on the skyscraper contract they have here and are planning considerable work in the Southwest.

The Murch Construction Company, who have general contract on the skyscraper, have a Memphis office in the Porter Building and have several other nice contracts for spring work.

The Selden-Breck Construction Co., Tenn. Trust Building has under plans several reinforced concrete jobs in their Southern office.

The Southern Ferro-Concrete Co. of Atlanta, Ga., is working on the Kahler loft building in Memphis.

Roach & Stansell, North Memphis Savings Bank Building, has been awarded two large railroad building contracts this week and have levee work in Illinois, Texas and Missouri.

M. E. Larkin, 112 Madison avenue, has several concrete jobs on the string for early spring work.

The DeSoto Gravel Company here has applied for a charter, with authorized capital of \$50,000, to deal in gravel, sand, brick, lime and all kinds of building material and to do a general contracting business, including the erection of houses and the grading and building of streets or railroads. The incorporators are: D. T. Russell, A. A. Gillespie, B. F. Alford and others.

W. B. Troy and others in the Byrd Building have this week incorporated another gravel company, of which details will be given in the next issue of Rock Products. This new company controls gravel pits in Benton, Perry and other counties of West Tennessee.

The American Snuff Co. will erect a \$30,000 addition to its factory at Front street and Keel avenue. The building will be three stories high and of reinforced concrete. The work will be done by the Southern Ferro Concrete Company. The main factory was only finished last fall.

The Exchange skyscraper here is to be nineteen stories with reinforced concrete floors and tile partitions. A caisson foundation will support the building. Concrete will be sunk thirty-five feet and reinforced.

Several new school buildings are to be built by the Board of Education, one at Fleece Station; another on Evergreen avenue, and another on Latham avenue. The first two will cost \$50,000 each and the last \$59,000.

Figures recently compiled show that Little Rock, Ark., last year surpassed all previous records in building values. The total for 1909 was \$1,538,810 against \$1,051,693 for 1908. The building record for Fort Smith, the next largest city in the state, was in excess of \$700,000, against \$525,000 for 1908.

ST. LOUIS.

ST. LOUIS, Mo., Feb. 19.—As building operations are largely identified with the realty market, it is gratifying to learn that the month started off with an activity seldom experienced by local operators in real estate and the prospect is good for great things by March 1. There have been fears of difficulties with labor unions on the part of many contractors, since several branches of the building trades issued their ultimatum for a raise of from 10 to 20 per cent. There will be concerted action to resist the unions on the part of the various contractors lest the increased cost of building should result in holding up prospective jobs and also involve them in loss on contracts already in hand. The matter will come to a head by the middle of March and all parties interested will know what to depend on.

Work on the extension of the American Hotel Building to include the corner of Sixth and Market Streets is announced to begin in April. The annex will cost about \$500,000 and will contain 300 rooms. The new addition will be identical with that portion already built, being ten stories in height.

The Ethical Society of St. Louis has purchased property fronting 100 feet on the south side of Washington Avenue, west of Grand Avenue, and will erect in the spring a hall for services which will cost about \$60,000. Louis C. Spiering will draw the plans.

The Shuberts will erect a new theatre and office building on Twelfth and Locust Streets. The structure will be twelve stories. Ground will be broken March 1. The house will have a seating capacity of 2,200 and will be a replica of the Maxine Elliott in New York, only much larger.

The Friedman-Shelby Shoe Company will erect a new building on Washington Avenue at Robbins Lane. The building is to be ten stories and constructed of reinforced concrete. Architects are at work on the plans.

The contract for the new police station to be erected at the corner of Tenth and Carr Streets has been awarded to Frederick Boeke, whose bid was \$40,038. The plans and specifications were prepared by George W. Piper, superintendent of police buildings. It will front 50 feet on Tenth Street, with a depth of 93 feet along Carr Street, and be of brick and terra cotta.

The most marked feature of the building operations in St. Louis for the past year was the number of new residences that were built, the same exceeding that of 1908 by several hundred, showing that the city is prospering and that more citizens own their homes.

A unique plan is about to be put into operation by the Hotel Jefferson Company. It proposes to construct a subway under Twelfth Street to connect the hotel with the new Shubert Theatre when built, so the guests of the hotel can attend the performances without going into the street. People attending the theatre will be able to go to the café after the performance without going outside.

A permit has been issued for the foundation of a large building to be erected at Nos. 320-336 Union Boulevard, to be erected by the Waterman Improvement Company. It will be an apartment house and represent an investment of nearly \$100,000.

Powder, dynamite and other explosives are quite largely manufactured in Missouri, mainly in Jasper and Pike Counties. The output averages in value over \$2,000,000 a year and gives employment to 280 men and a dozen women. The product is nearly all used in the mining and quarrying sections of the state.

Authority to erect business buildings as high as twenty-two stories having passed both the Council and House of Delegates, the measure now only awaits the signature of the mayor.

Mr. Sawyer, of the Acme Cement Plaster Company, reports that the demand for hard wall plaster is remarkably good and is coming from all sections of the country. It looks as if 1910 was going to be the banner year in building, largely owing to the prosperity of the agriculturalists who are investing some of their surplus money in real estate in the nearest cities to their homes.

The Union Sand and Material Company will increase its capital stock from \$3,400,000 to \$6,000,000. An appraisement of the company's assets has recently been made and the directors ascertained thereby that more than 50 per cent of the contemplated increase of the stock can be paid from the surplus assets. A. H. Craney, Jr., sales manager of the cement department, states that there is an excellent demand for Portland cement, but in view of a probable advance in the market business is being booked for immediate shipment.

The Glencoe Lime and Cement Company have nearly completed three kilns at their plant at Glen Park, to be operated with the new gas producer system installed by Ernest Schmatolla. An elevator for two cages—one running down with lime and the empty

cage returning on the other elevator—the foot of the elevators being near the spur railroad track.

Mr. Willis, of the Hunkins-Willis Lime and Cement Company, states that the outlook for business this spring is excellent. Building in St. Louis, as indicated by the number of permits issued, is steadily getting more active.

R. A. McKinnon, sales manager of the Continental Portland Cement Company, reports an active demand for cement coming from outside points. Prices are strong with an upward tendency.

The Mutual Rubber Roofing Company, of St. Louis, has been incorporated. Capital stock \$2,000 fully paid. Incorporators: Gustav Richter, W. T. Jones and P. Reinhardt. The company will deal in roofing material.

The Illinois Concrete Machinery Company, of Buda, Ill., has been incorporated. Capital \$140,000. Incorporators: L. H. Scott, C. S. Scott and Howard H. Priestly.

The Independent Lime and Cement Company, of St. Louis, has been incorporated. Capital stock \$30,000. Incorporators are Lloyd F. Crouch, Francis Campbell, A. B. Clayman and others.

The National Sheet Plaster Company has been incorporated. Capital stock \$100,000 fully paid. The incorporators are Edward F. Carter, William F. Kelly and Robert T. Sullivan. The company will manufacture all kinds of wall plaster.

The Multi-Board Portable House Company has been incorporated. Capital stock \$75,000 fully paid. The incorporators are Robert R. Brewer, Clarence D. Coleman and W. Sanford Avis. The company will engage in manufacturing.

The Niemeyer Brick and Tile Company, of New Memphis, Ill., has been incorporated. Capital stock \$5,000. The incorporators are William Niemeyer, Sr., Henry E. Niemeyer and William Niemeyer, Jr.

East Side News.

A four-story brick business building will be erected in Belleville on the site of the present Thomas House Building, one of the city's oldest landmarks. The structure will be 150'x154' and will cost upwards of \$60,000. Bauer Brothers are the contractors.

One hundred dollars was subscribed recently at Alton to erect a grand stand for the use of bystanders who are watching the erection of the big Luer Brothers building at Second and Ridge Streets. The onlookers made so many suggestions that the owners of the site deemed it advisable to have a grand stand built overlooking the work, in order that persons who have time to watch the erection of the building may do so in safety and comfort.

The enlargement of old plants and the erection of new mills at Granite City has brought in so large a number of men that the living accommodations are entirely inadequate. Unless a number of houses are erected soon, many families will be compelled to live in tents.

Joplin, Mo., is to have a new Union railroad station to cost upwards of \$750,000. The station is to be built near the Santa Fe, Missouri, Kansas & Texas, Kansas City Southern and Missouri & North Arkansas railroads.

CENTRAL ILLINOIS.

SPRINGFIELD, ILL., Feb. 20.—Brick will be used in paving the seven miles of road from Belleville to Edgemont. City Engineer Harper, of Belleville, has been making the survey.

The Capitol City Concrete Construction Company, of Springfield, is the lowest bidder on Pine Bluff, Ark., improvements, which call for about ten miles of concrete sidewalks and five miles of combined concrete curb and gutter.

Roeder & Greenman, at Quincy, are putting in 40,000 square feet of concrete flooring in the Garner Governor plant there.

The Stoneware Pipe Company, of East Alton, secured the contract for furnishing pipe in the Collinsville, Ill., sewer contract. The contract was sublet by Peer & Gauen, of Collinsville.

J. H. Theur and son Charles, of Edwardsville, will form a contracting company to be known as the Theur Construction & Supply Company some time in March.

J. E. Bretz, of Springfield, will begin work the middle of April on seventeen blocks of brick paving in Clinton, Ill.

James E. Dailey, of Jacksonville, will use 13,000 feet of drain tile in his contract for the Union Drainage District near Hammond, Ill.

The Purington Paving Brick Company, of Galesburg, has elected W. S. Purington, president; Frank G. Matteson, vice-president, and W. H. Terwilliger, secretary.

W. L. Powers, of Decatur, has the contract for the Pierce-Caldwell bakery, costing \$40,000, to be erected in that city. Reinforced concrete will be used and the inside lined with white brick.

TOLEDO AND NORTHWESTERN OHIO.

Toledo, O., Feb. 19.—The wheels of activity in building circles are beginning to turn in Toledo and northwestern Ohio and a most encouraging outlook presents itself at this time. Building promises to be on a more liberal scope this season than last and construction work in all lines will probably be nearly double last year's if engineers and others who have been looking the situation over carefully can be taken as a safe criterion.

Engineers Riggs and Sherman are making plans for a sewerage disposal system for Bellefontaine, while Findlay, Fremont, Tiffin, Fosteria, Sandusky, Wauseon, Defiance and Bowling Green are each taking preliminary steps toward doing considerable paving. Wood, Fulton, Erie, Seneca and Lucas counties are arranging to spend large sums in road repair and building work and early estimates from county commissioners show that the number of culverts and other concrete work of a minor nature will be large.

The commission of expert engineers appointed by the city to canvass the bids for the new Cherry Street bridge have filed their report. This commission consisted of F. H. Kindt, Pittsburg; Ralph Modjeski, Chicago, and W. J. Sherman, Toledo; and in its report the first two favored awarding the contracts on the present bids while the latter engineer favored advertising for additional or new bids. On all other points the canvassing board was united in its answers, its report dealing largely with the merits of the Melan system of reinforced concrete construction and the best method of caring for traffic during the construction of the bridge proper. Shortly after the filing of the report it was noised abroad that as a result of the findings of the board, the contract would be awarded immediately, but Director Cowell of the Department of Public Service states that as yet nothing has been done regarding bids already filed and that nothing would be done till he had personally canvassed each one.

By the organization of the Fishack Gypsum Co., the Fishack Plaster Co., which has been doing business in Toledo since 1895 will lose its identity and become merged into a much larger company. E. H. Fishack, who has been at the head of the Fishack Plaster Co., will be at the head of the new company, and associated with him will be C. C. Banting, J. W. Banting and Robert K. Banting, who have been associated in business here for many years under the firm name of the Banting Machine Co., handlers of farm threshing machines and traction engines. The new company has been organized with \$65,000 capital, which will be increased as the business demands and as other plants are absorbed, which feature of the business is now under consideration.

The immediate intention of the company is to erect a "three kettle" mill at Gypsum, near Port Clinton, Ohio, and the development of a tract of gypsum deposits now owned by the Fishack Plaster Co. Later it is the intention of the company to consolidate the plants of the Fishack Plaster Co., located at Ironville, Ohio, Ft. Wayne, Ind., and Gypsum, where the new mill will be erected.

Claud Smith, for several years associated with the Acme Builders' Supply Co., but who resigned several months ago to engage in the plaster contracting business in Oklahoma, has accepted a similar position with the Superior Supply Co., recently organized. Mr. Smith will direct the business and is now engaged in putting the finishing touches on the new company, which is to be ready for business by March first. A. B. Luton, president of the company, spent much of January in Grand Rapids, Michigan, where he was engaged in the paving business prior to accepting the state sales agency for the Metropolitan Paving Brick Co., four years ago. He will continue in his capacity as representative of the Metropolitan Paving Brick Co., leaving the active management of the Superior Supply Co. to Mr. Smith, and William Brown, secretary of the company.

Peter J. Degnan, president of the Toledo Builders' Supply Co., is very optimistic over the outlook and says that their mid-winter business is larger than it has been for several years.

The Toledo Builders' Exchange has just finished remodeling and decorating its quarters on the fourth floor of the Smith and Baker building. President S. J. Pickett says that the exchange is in a better shape financially and from point of members than at any time since its organization years ago. It will shortly begin a campaign for additional members, and during this year will seek to get the members together oftener for both social and business purposes. The campaign for new members will be under the direction of Assistant Secretary Charles T. Lawton.

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"OK" Cement is ground 85% fine on the 200 mesh sieve—and contains 10% or 38 lbs. more actual cement than the coarser ground cements—OK Cement will carry one third more sand than other brands—it is the highest possible grade and guaranteed in every particular and to meet all requirements of the U. S. Army and American Society for Testing Materials.

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ALWAYS UNIFORM

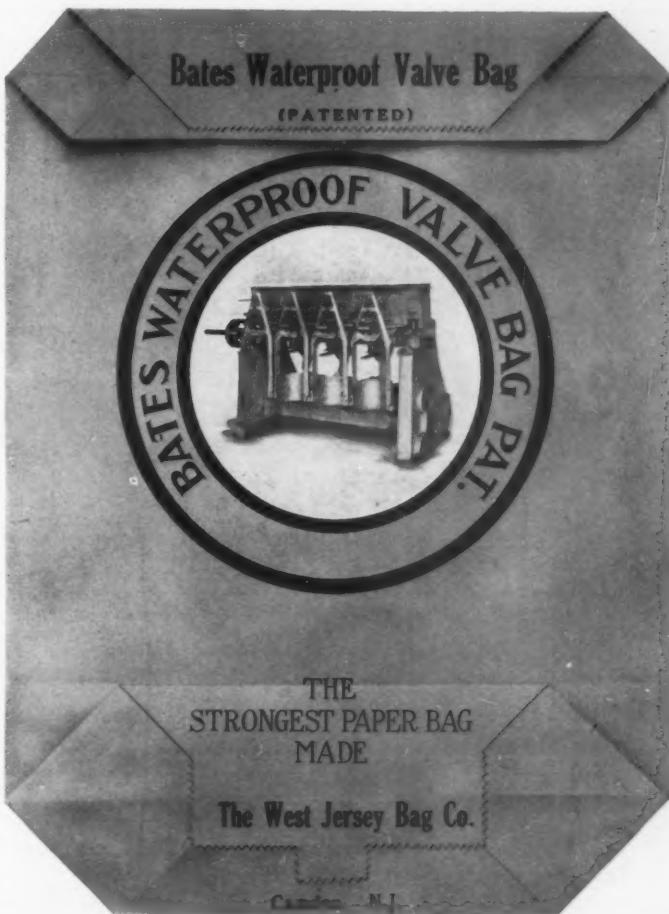
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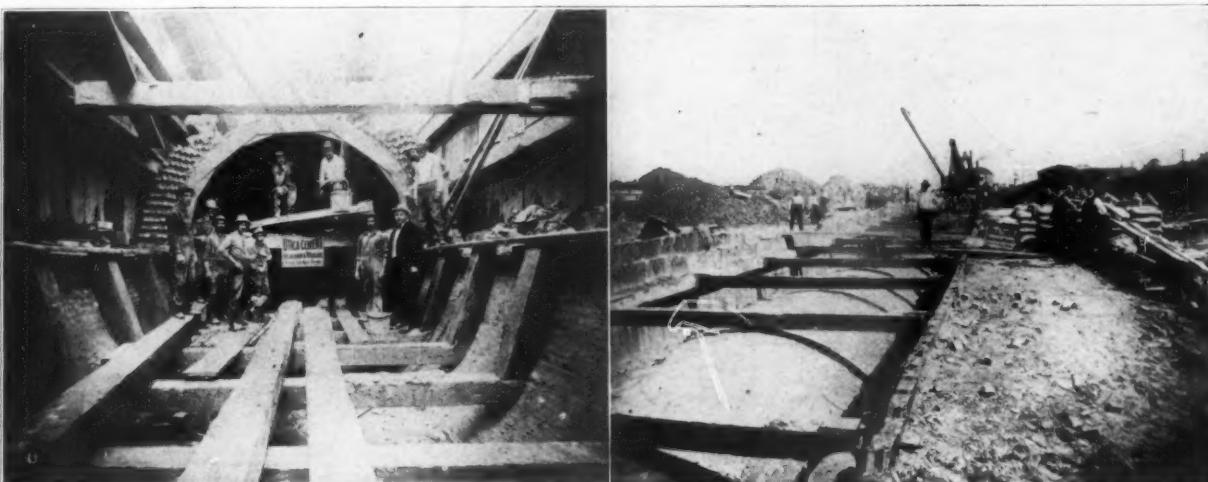
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RELIABILITY

**WAR DEPARTMENT
ENGINEER OFFICE, UNITED STATES ARMY.**

Nashville, Tenn., February 20, 1909.

KOSMOS PORTLAND CEMENT COMPANY, Louisville, Ky.

Dear Sirs:—Replying to yours of the 12th instant, I beg to advise you that our records show that 22,250 barrels of Kosmos cement were received at Hales Bar Tennessee River, for the lock under construction at that point, between June 23 and September 25, 1908. All of this material was tested and all of it accepted under the requirements of the Engineer Department specifications.

Very respectfully,
WM. W. HARTS,
Major, Corps of Engineers

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Cement as finely ground as any on the market.
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STOP THE NEEDLESS WASTE.

Astounding Fire Losses Are Proved to Be Entirely
Needless by Visiting the Chicago
Cement Show.

The tremendous fire losses of the United States, and the necessity for the adoption of better methods of construction, which have been referred to frequently in the columns of ROCK PRODUCTS, are set forth in impressive form in a bulletin just issued by the United States Geological Survey on the subject of "The Fire Tax and Waste of Structural Materials in the United States." The bulletin is impressive because it states in exact terms the extent of the waste caused by fire, and compares it with the relatively small losses suffered by countries of Europe which have adopted saner building regulations.

In determining the amount wasted annually in this country on account of fire, the Government statisticians very correctly considered not only the loss directly by fire, but also the expense of maintaining fire departments, the added burden placed on water systems owing to the necessity for preparing for possible—and in many instances probable—conflagrations, and the cost of insurance. The results are almost crushing, because they show the folly and utter recklessness with which the American builder has carried on his operations, using inflammable materials when he could just as easily and cheaply have used fireproof ones.

It may not always have been true that the use of fireproof materials is practicable and cheap in all parts of the United States, but it is so today. There is no longer any need of using wood when concrete, which has been proven fireproof, can be secured at low expense. Yet the number of fireproof houses which are going up is still lamentably small compared with the number of those which have a tremendous fire hazard, while the loss by fire, the burden for which there is no compensation, is growing greater by leaps and bounds each year.

The investigation made by experts of the Geological Survey showed that the annual fire loss is about half the amount that is expended each year for new buildings. In 1907, the year on which the statistics secured were based, it reached \$456,485,000, an amount exceeding the total value of the gold, silver, copper and petroleum produced in this country in that year. The fire cost in the United States is five times as much per capita as that of any European country, and is surely draining the splendid natural resources of the nation.

The loss on buildings burned in 1907 was \$109,156,894 and on their contents \$105,927,815, making a total of \$215,084,709, to which must be added, as suggested, the amounts expended for insurance and fire protection apparatus and appliances. As might have been expected, the loss was much greater in frame buildings of inflammable construction than in brick, concrete, iron and stone buildings. In the latter there were 36,140 fires, having a loss of \$31,000,000 on the buildings and \$37,000,000 on the contents, while on the other hand there were fires in 129,117 frame buildings, entailing a loss of \$78,000,000 on them and \$69,000,000 on their contents.

One of the worst features of the tremendous loss by fire in the United States is the fact that it involves a terrible loss of life. In 1907, 1,449 people lost their lives and 7,654 were injured. Charles Whiting Baker, editor of *Engineering News*, of New York, said last year that if the buildings consumed were placed side by side they would line a street running from New York to Chicago, while an injured person would be taken from a building every 1,000 feet along and the charred remains of one burned to death every 1,500 feet.

It is only necessary to refer to the great fires of San Francisco, Baltimore, Chelsea, Chicago and Boston which have happened during the past forty years to reveal the terrific possibilities occasioned by the faulty construction of the buildings of the great cities, and to remember the disasters of the Iroquois Theater, Chicago, the Collinwood school fire and the scores of other holocausts to understand how easy it is to destroy the lives of hundreds in the firetraps which absolutely fill the country.

The figures on the fire losses prove two things: First, that the losses on frame buildings were very much in excess of those of other construction; and secondly, that the losses in the rural districts were

greater than those in the cities. This was due to the fact that in the country there is practically no fire protection provided, so that while the building construction in the cities is not much better than that in the country districts, the remarkable efficiency of the municipal fire departments keeps down the loss to the lowest figure possible in view of the nature of the buildings which have to be guarded.

In most European cities there is a prohibition against the erection of frame buildings except for temporary structures. The result is that the annual per capita loss there is \$4.48 against \$2.51 in the United States. The fact that lumber has until recently been plentiful in the United States and that it has always been scarce in Europe accounts for the difference, but the growing scarcity of timber in this country and the necessity of protecting the forest resources of the country should operate to diminish the number of frame buildings erected, especially as the cost of them is practically as large as those which are erected of fireproof material. Statistics compiled with regard to states where timber is scarce show that the fire loss there is much less than in those communities where it is plentiful, once more pointing to the potential destruction stored up in the frame or wooden building.

Analysis of the various factors involved in guarding against fire—and doing it imperfectly, at that—show that the total cost of waterworks chargeable to fire service is \$245,671,676; the total cost of fire departments, \$107,063,524, and the total cost of private fire protection appliances \$50,000,000, making an investment of \$402,735,000. In addition to this there is the dead loss of \$215,084,709 a year from fires; \$145,604,362, the amount of fire premiums paid above the amount of losses paid; \$28,856,235, the annual cost of maintaining the water service; \$48,940,845, the cost of maintaining fire departments, and \$18,000,000, the total annual expense of maintaining private protection therefore; besides the tremendous amount of money invested in construction and equipment to prevent fire loss, there is an annual loss and expense totaling \$456,486,151.

The conclusions reached by Government experts, after studying the statistics which they have secured, are as follows, and back up everything that ROCK PRODUCTS has said about concrete material as a fireproof material:

How to Reduce Fire Losses.

The enormous waste due to fire may possibly be reduced—

1. By tests and investigations made to determine the relative fire resistance of building materials and the relative rates of heat conductivity of such materials and by the development of systems of construction which will offer the maximum resistance to fire. The tests should have in view the classification of building materials in the order of merit and the possibility of cheapening the cost of construction by using those best suited to the purpose, inasmuch as the cheaper materials are now often not employed through lack of knowledge of their availability.

2. By the dissemination of information regarding the more noninflammable building materials, their strength and durability, the methods of utilizing them in construction, and the availability of the most suitable of these materials at places near the locality at which they are wanted.

3. By the enactment and enforcement of building codes with a view to insuring more fire-resistant and more nearly fireproof construction. In many European cities the erection of wooden buildings is prohibited, and the oversight of brick, stone, steel and cement construction is such as to diminish the danger from fire due to defective flues, poor electric wiring and other faults of construction, and to make it unlikely for a fire to spread beyond the building in which it originates.

Waste of Natural Resources by Fire.

Aside from the enormous and unnecessary tax that is paid by the people by reason of fire losses, there is another loss of large consequence to the future of the country—the waste of natural resources due to destruction by fire.

The timber supply of the United States is rapidly approaching exhaustion and, unless means are taken to limit the waste (a great deal of it through fire) and to replenish the supply through reforestation the timber resources of the country will be exhausted within the next quarter of a century. The known supplies of high-grade iron ore in this country, estimated at more than 4,788,000,000 tons, can not be expected to last beyond the middle of this century unless the present increasing rate of consumption is curtailed. There are in addition about 75,000,000,000 tons of low-grade iron ore which will undoubtedly be used to some extent as the price of iron advances. The supplies of stone, sand, gravel, clay, cement, lime and slate are practically inexhaustible, and as the supplies of timber and iron are depleted and the prices of these are increased it is evident that the United States must turn to concrete-making materials, clay products and building stone as substitutes for wood and iron.

Another waste of structural materials that is closely related to the fire loss is that involved in the use of iron and steel that are placed underground in city water mains or used in pumping plants to provide a water supply for conflagration protection in excess of that needed for ordinary uses. The investigations reported herein indicate that 22 per cent of the total expenditure on behalf of public water supply is due to additional service necessary for protection against fires of such magnitude that they may spread beyond the building in which they started. There are 2,000,000 tons of metal, valued at \$127,000,000, and 350,000 hydrants, valued at nearly \$30,000,000, in the systems provided for fighting fires of conflagration dimensions.

The mineral materials available for structural purposes may be divided into two classes—(1) iron, steel,

copper, nickel and their manufactures, the supplies of which are limited and which are themselves subject to destruction through weathering, fire and other causes; (2) stone, clay products and cement and concrete manufacturers, which are less subject to destructive agencies and the supplies of which are practically inexhaustible.

In building any constructive work the substitution of the materials of the second group for the more commonly used wood and metal manufactures should be encouraged as having an important influence on the preservation of the supplies of the more perishable and scarcer materials. The use of building stone and clay and cement products in this country has been restricted by competition with the much cheaper wood products and the more easily fabricated and more available metal products. Improved methods of preparing the raw materials for use in building construction are, however, rapidly diminishing the difference in cost, and careful investigation as to their structural qualities and the more suitable structural forms would have an important influence in further reducing this difference in cost and in enlarging the use of the more permanent materials.

Within the last decade the value of the cement manufacturers of this country has increased from \$9,859,000 to \$55,803,000, or nearly sixfold. In the same time the value of the clay products has increased from \$74,487,000 to \$183,942,000, or has nearly doubled, and that of the building stone has increased from \$26,635,000 to \$71,106,000, or has nearly trebled. As the government, through its investigations, is determining the strength, durability and fire-resisting properties of these materials and the more suitable forms for their use, and is disseminating information relative to their comparative cheapness and great permanence, a still greater relative increase in their use may be confidently expected in the near future.

Within the last few years marvelous strides have been made in the substitution of iron and steel for wood as a result of the careful investigations of their properties made by engineers, physicists and chemists, and the great amount of attention paid to their fabrication by manufacturers and architects. More recently the engineering and technical professions have advanced to a great extent the uses of cement in concrete manufacture.

Advises Novel Concrete Roads.

SAULT STE. MARIE, MICH., Feb. 17.—A. W. Wolfe, of Escanaba, has a suggestion for a new kind of country road which he says would cost only a quarter as much as the present improved rural highways and would last longer. He writes about it as follows:

"First prepare the road bed, having it well turnpiked, then in its center dig two parallel trenches eight inches wide, the inside walls being about forty inches apart. Then fill these ditches up with a good concrete, in blocks about four feet long, the concrete being built similar to the manner of building sidewalks, but no top dressing being used, and the concrete being rounded or crowned in the center with still more rounded or inclining corners. To build a mile of this kind of road will require 8,800 cubic feet of concrete which could be built for 10 cents per cubic foot, or \$880 per mile. The space between the concrete can be filled in with gravel, soil or stone for the foot path of the horses, while the concrete will carry the wheels. Of course, the outside of the concrete must also be leveled up with soil for turn-out conveniences. Here is what I maintain is reasonable to claim for this kind of a road: First, its cost will be less than half the cost of roads we are now building; second, it will never be injured by water; third, horses will always have easy footing; fourth, its maintenance will be only nominal; fifth, it will always be in good condition and unlimited loads can be hauled; sixth, automobiles could not tear up this kind of road; seventh, it will be dustless. If this kind of road should prove practical the highways could be double-tracked in sections where the traffic demanded it. You all know that in the country, no matter how well a road is macadamized, after a little time the teams will be following a path and rut. With this kind of road we will have the path but not the rut."

Concrete for Elevator Foundations.

In a recent number of the *Modern Miller* the following significant article on the use of concrete foundations for grain elevators was published. Its significance will be the more apparent when the enormous loads which modern elevators carry are taken into consideration.

There are few millers who will not incline their ear to a discussion of proper construction of concrete storage tanks. Some recent foundation work for such elevators has stimulated discussion because fundamentally opposite in principle. In one recent case a milling firm chose as a foundation for four tanks a concrete quadrangle three feet thick extending three feet beyond the perimeter of the quadrangle. This concrete foundation was set on soft ground and when the elevators were filled showed no signs of settling. Another foundation was concrete placed over piling and the base did not extend outside the wall lines. In this case the elevators showed such an alarming tendency to settle that houses adjoining were vacated. The question discussed is the value of piling as means to carry a load. In this case its efficiency is doubted and the "snow shoe" scheme of making the one-piece foundation with greater area than the base of all the elevators is preferred by those who studied the merits of such construction.

This is merely an expression of opinion from practical men, and builders evidently have some conflicting views about foundations to carry heavy loads. Those contemplating elevator construction, other than the reliable steel storage tanks of moderate capacity, will no doubt be interested in some recent results of building big concrete tanks without going to rock.

CONCRETE IN LARGE FACTORY CONSTRUCTION.

[Continued from Page 3.]

if constructed of concrete, and on account of the fact that the maximum floor space is required, structural steel columns were used. These are of the H-column type and are encased in concrete.

The elevator is to be the largest of its type in New England, having a platform 8' 6"x21' 6" over all. It is to be electrically operated, and is provided with full automatic gates, and runs through the roof, and a large pent house is provided at the top of the elevator shaft. The shaft opening is thoroughly fireproof, constructed of 8" terra cotta blocks, plastered with Portland cement mortar.

The stair well, lighted by hip skylight, is also enclosed with terra cotta blocks, plastered with Portland cement, but the stairs are built of reinforced concrete.

The building is equipped with two automobile washstands, and on each floor are toilet rooms and other plumbing fixtures, making the building complete in this respect.

The heating system is of the simple gravity return type. The problem of running returns back to the boiler offers much study for a building used for this purpose, where the maximum headroom may be required throughout. The radiation on the first floor is carried overhead, and that on the other floors is run along the windows, while additional circulation is carried on the fourth floor, where a considerable amount of heat will be necessarily lost through the elevator shaft, opening to the roof. The boiler room is depressed slightly below the first floor, and is enclosed by partitions of hard plaster constructed on metal lath.

The building is provided with a complete sprinkler system, and on account of this and its fire-resisting construction is allowed the minimum insurance rate.

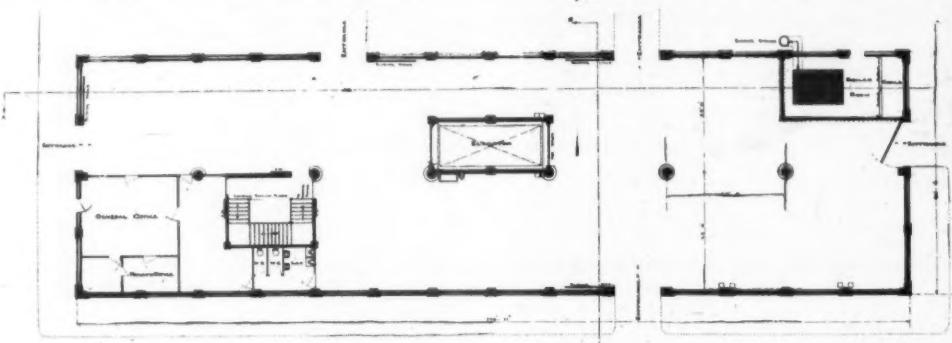
All electric light wires are carried in conduits placed in the concrete, and thus none of the wiring is exposed.

Reinforcement Details.

Plain round rods were used throughout. The specifications for the reinforcing steel called for medium steel with an ultimate strength of from 60,000 to 70,000 pounds, an elastic limit of not less than one-half of the above values, and a percentage of elongation in S" of 1,400,000 divided by the ultimate strength, and the additional requirement that rods should be bent, cold, 180 degrees around a diameter equal to their own without fracture. Frequent and representative tests were made to determine the satisfactory quality of the steel.

In the construction of this building it was required that beams, girders and slabs be poured at the same time, for the reason that the slab takes a part of the compression both for the beams and girders, and horizontal joints between the slab and the beam, or girder, form planes of weakness. Where this could not be done in every instance vertical joints in the floor slab were allowed at the center of the beams and girders, since these places are points of small shear and a joint here does little or no harm.

The curtain walls and parapet walls are reinforced with $\frac{1}{4}$ of 1 per cent of steel, consisting of $\frac{3}{8}$ "



FIRST FLOOR PLAN OF D. P. NICHOLS & CO. BUILDING.

diameter round rods.

The beams are 8"x23", this depth including the slab. They are reinforced with four $1\frac{1}{8}$ " diameter rods, one-half of which are bent up to pass over the supports. The beams are increased to 34" in depth at the girders.

The girders are 15"x34" and are reinforced with six $1\frac{1}{4}$ " rods and two $1\frac{1}{8}$ " rods. The two $1\frac{1}{8}$ " rods and two of the $1\frac{1}{4}$ " rods are bent up to take care of the negative bending moment over the supports.

Diagonal tension, in both beams and girders, is taken care of by $\frac{3}{8}$ " diameter stirrups in conjunction with the bent up tension steel.

The floor slab is $4\frac{1}{2}$ " thick and reinforced with $\frac{3}{8}$ " rods, 5" center to center. Half of these rods are bent up into the top of the slab over the beams. In addition $\frac{3}{8}$ " diameter rods, 10" center to center, were placed in the top of the slab over the beams. The floor slab was also reinforced with $\frac{3}{8}$ " rods, 10" center to center, laid parallel to the beams.

The roof is constructed exactly the same as floors, and is water-proofed with six courses of plastic slate and felt, and then covered with a 2" granolithic wearing surface reinforced with number 10 Standard expanded metal.

All materials were carefully inspected and regularly tested, and this work was much facilitated by a resident experienced inspector representing the engineers, Messrs. Monks & Johnson. Having standardized the materials of construction in their specifications the engineers consistently followed this practice throughout the work. "Giant" Portland cement, furnished by the United Building Material Company, Boston, was exclusively used.

The foundation concrete was mixed in the proportion of one part cement, three parts sand and six parts crushed rock; all of the concrete above the foundations was mixed in the proportion of 1-2-4.

Realizing the important part the fine aggregate plays in the quality of concrete, the engineers had frequent tests made of the sand, and thereby standardized this material as far as possible for the entire work. The importance of such tests cannot be too strongly emphasized.

Crushed work formed the coarse aggregate for the concrete, and in the foundations ranged in sizes between $\frac{1}{4}$ " and $1\frac{1}{2}$ ", and in the work above between

$\frac{1}{4}$ " and $\frac{3}{4}$ ". This material was required to be perfectly clean-screened. Particular care was exercised in gauging the materials to insure correct and uniform proportions.

All the concrete was mixed in a batch-mixer, provided with baffle plates, and the greatest care was exercised to avoid excessively wet concrete, at the same time an ample amount of water was used to insure the ready flow of the concrete between the reinforcing metal.

The mixing plant was located about midway of the long diameter of the building, and the concrete was distributed on each floor in steel dump cars operating on a light industrial track, assembled in short sections for easy adjustment.

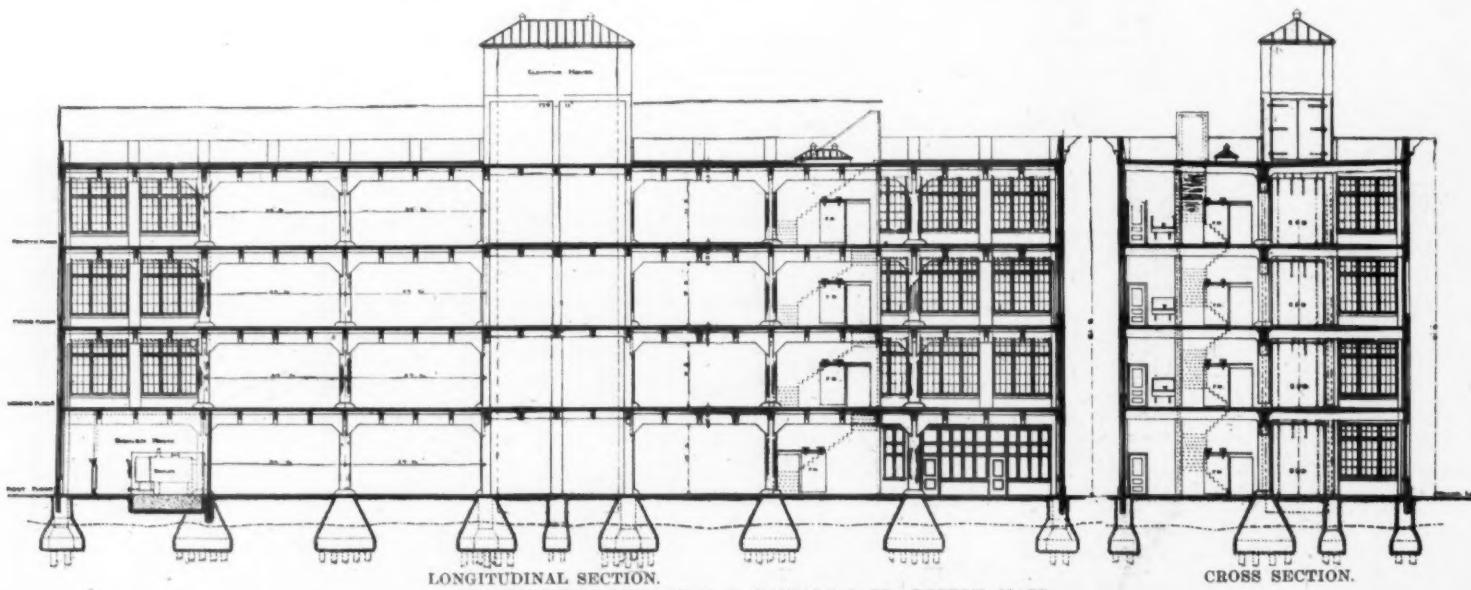
All of the exposed exterior concrete was finished to a rubbed surface, producing a very satisfactory effect, and insuring the permanence of the surface treatment.

The contract price for this building was $8\frac{1}{4}$ cents per cubic foot, or \$1.18 per square foot, not figuring the roof as a floor, although so constructed. The final cost, including elevator, heating, sprinkler system, plumbing, etc., was 10.7 cents per cubic foot, or \$1.53 per square foot of floor area, excluding the roof as a floor, as before. The cost would have been less for shorter span construction and for concrete columns instead of structural steel, and for roof of usual construction, whereas in this case the roof has the same strength as the floors below, and will be used in the same way.

A word in regard to cost may be opportune in this connection. The cost of work is a variable quantity, being materially influenced by local conditions, cost of materials and labor, time allowed for construction and range of climatic conditions to be expected during construction.

The writer believes that it would be distinctly to the advantage of owners if engineers could be permitted to complete their plans in the early winter, with ample time for consideration and adjustment of all details.

This building was designed by and built under the supervision of Messrs. Monks & Johnson, architects and engineers, 7 Water street, Boston, Mass., and the general contractor for the work was the C. A. Dodge Company, members of the Master Builders Association, Boston, Mass., with offices on Albany street, Cambridge, Mass.



LONGITUDINAL SECTION.
CROSS SECTION.
FACTORY BUILDING OF D. P. NICHOLS & CO., BOSTON, MASS.

CEMENT

The Right Man Selected.

W. H. Ford, of Montreal, has been appointed general sales manager of the Canadian Portland Cement Co., Ltd., which comprises practically all of the cement mills in the Dominion, as a result of the great merger reported in ROCK PRODUCTS for November.

Mr. Ford is a southern gentleman, only a little past thirty, and has had a wonderfully successful career in the cement industry. He hails from Charleston, S. C., and began as salesman for the Carolina Portland Cement Co. in the South Atlantic territory.

In 1906 he was chosen by the late Robert Horner, of the Kosmos Portland Cement Co., of Louisville, Ky., to become sales manager and introduce the then new Kosmos brand. For two years in this connection his efforts were crowned with phenomenal success, and in 1908 he went to Montreal as vice-president of the W. G. Harranrant company, to introduce the new Vulcan brand in Canada. In this new territory he set to work and rapidly mastered the situation and sold the entire output of his mill despite the unfavorable conditions that were existing at the time. As a matter of fact, he richly deserves the promotion which has come to him by the record of achievement he has made.

His many friends in the trade are extending cordial congratulations to Mr. Ford, amongst whom ROCK PRODUCTS is by no means the least.

Merger of Two Big Companies.

NAZARETH, PA., Feb. 16.—Acceptances are being obtained from stock and bondholders for a merger of the Portland Cement Co. and the Bath-Portland Cement Co.

Joseph A. Horner is president of both companies. The new organization is to have a capital of \$5,000,000, with a combined output of more than 3,000,000 barrels a year. The Nazareth company has securities amounting to \$2,500,000 and the Bath company \$1,000,000. To be included in the merger are mills in Maryland and Virginia. The combination will command southern as well as New York, Philadelphia and New England markets.

Shortly after the Nazareth mill had been established, the first to be erected in the Northampton cement region, it was bought by a syndicate of New York capitalists that included members of the Vanderbilt family. The Bath company securities are held chiefly in Philadelphia, Camden, Newark and Pittsburgh.

Condition of Southwestern States Co.

DALLAS, TEX., Feb. 16.—At the annual meeting of the stockholders of the Southwestern States Portland Cement Co. stockholders were present from Texas, Kansas, Iowa, Minnesota, South Dakota, Indiana, Michigan and other states, and nearly all of the stock was represented in person or by proxy.

The financial statement of the company submitted by the board of directors shows that the plant is operating profitably and the company is in good financial condition. The members of the old board of directors were unanimously re-elected. The officers and directors are as follows: W. F. Cowham, president and general manager; A. C. Stich, first vice-president; Thomas H. Dinsmore, second vice-president; W. H. L. McCourtie, secretary; John W. Shove, assistant secretary; N. S. Potter, treasurer; Dr. C. H. Wagner, J. H. McNair and W. W. Hawley, directors.

Big Increase in Atlas Plant.

HANNIBAL, Mo., Feb. 17.—Plant No. 5 of the Atlas Portland Cement Co., at Ilasco, after having been closed down for several weeks on account of a shortage in coal supply, has been reopened and 300 new men put to work. The force will be increased gradually until about 800 new men have been employed. The cement plant will soon be running full blast and there will be no excuse for anyone being idle.

Plant No. 5 was recently remodeled throughout. Two new kilns, said to be the largest in the world, were installed and several other improvements were made. During the past six months nearly \$500,000 has been spent on the works.

Extensive Operations in Virginia.

PHILADELPHIA, PA., Feb. 18.—Following a recent visit of Robert B. Lesley, president of the American Cement Co., of Norfolk, Va., the Norfolk Cement Co. has begun operations on a plant there which will cost,



WILLIAM H. FORD, SALES MANAGER CANADIAN PORTLAND CEMENT CO., LTD.

with the site, \$1,000,000. R. E. Griffiths, of Philadelphia, is president of the Norfolk Cement Co., which is a subsidiary company of the American Cement Co. It is proposed to make the output of the Norfolk plant 1,000,000 barrels annually. The plant and large docks are being constructed opposite the Norfolk Navy Yard. It has been announced that the raw material will be brought from Smithfield, Isle of Wight county, Virginia, where the American Cement Co. has secured an unbroken stretch of twenty-nine miles of water front property along the James river.

Alpha Absorbs Big Company.

TRENTON, N. J., Feb. 18.—By merger filed with the secretary of state the Cement Manufacturing Co., with a capital stock of \$2,000,000, was absorbed by the Alpha Portland Cement Co., which has works in Warren county. This action was intimated in the January number of ROCK PRODUCTS.

The Alpha company had a capital stock of \$6,000,000, of which \$2,000,000 was outstanding. The capital stock of the consolidated corporation is \$10,000,000, divided into \$8,000,000 common and \$2,000,000 preferred, the latter bearing 7 per cent cumulative dividends.

The officers of the new concern are: President, Arnold F. Gerstell, Easton, Pa.; vice-president, John M. Lockhart, Pittsburg, Pa., and secretary and treasurer, Gabriel S. Brown, Easton, Pa.



GEORGE S. BARTLETT, SALES MANAGER MARQUETTE CEMENT MANUFACTURING CO.

Death of Wm. P. Dickinson.

William P. Dickinson, father of Theodore G. and William Dickinson, vice-president and general manager, respectively, of the Marquette Cement Manufacturing Co., died suddenly January 30. Despite his advanced years—his age was 89—Mr. Dickinson's death was unexpected, as he was a man of robust health, and active in business affairs up to the very last. Born at Hadley, Mass., in 1820, Mr. Dickinson came to Chicago in 1860, and became an influential factor in the commercial life of the city, especially in connection with the Board of Trade. He leaves a widow, three sons and one daughter. William and Theodore Dickinson, the sons, are widely and popularly known in the cement trade.

Death of W. J. Prentice.

On February 24 death claimed W. J. Prentice, president of the Crescent Portland Cement Company, of Pittsburg. He was a well known figure in the industry, present at all the meetings of the cement manufacturers and supply dealers for years. No man was more popular, for he was a genial companion, ever ready with a droll story or an anecdote of his long business experience. In early life he was a steamboat clerk and captain in the Ohio and Mississippi river trade. He knew the conditions which Mark Twain has made famous in his writings. Capt. Prentice was afterward connected with the building material business in Pittsburg for many years, and was one of the founders of the Castalia Portland Cement Co. His latest venture in cement was the "Crescent," which has just completed its new mill near Pittsburg and is now entering the market with a new brand. He was familiarly known as "Pap" Prentice, and had a host of friends, who are extending with us their sympathy to his family in this sad hour.

James W. Fuller is Dead.

Cement men the country over will sincerely regret the death of James W. Fuller, president of the Lehigh Car, Wheel & Axle Works, at Catasauqua, Pa., on January 15. While not actively engaged in the cement industry, Mr. Fuller had for years been active and prominent in its development. He was possessed of great inventive genius, which he used in the production of Portland cement making machinery, and was a moving factor in the construction of a number of big mills which are now in successful operation, planning and making and placing the equipment which assured success. As one of the inventors of the famous Fuller mill, he had a world-wide reputation. Despite his prominence Mr. Fuller was still a comparatively young man, well on the "sunny side" of 50. He will be sorely missed as, in addition to his mechanical and productive talent, he was a most pleasant companion, a faithful friend, and an accomplished gentleman.

Universal to Increase Capacity.

The United States Steel Corporation has authorized the expenditure of \$2,450,000 by one of its subsidiaries, the Universal Portland Cement Company, in the construction of cement plant No. 6 at Buffington, Indiana, to have a capacity of 2,000,000 barrels of Universal Portland Cement per annum. This plant will be located alongside of plants Nos. 3 and 4 of the same company, which have been in operation for some years. It will be so designed as to be easily extended to its ultimate capacity of 4,000,000 barrels per annum without interference with operations. This plant will be operated entirely by electric motors, the power being transmitted five miles from the power station at Gary, Indiana, containing gas engines utilizing waste gases from the blast furnaces.

With the extension of cement plant No. 5 at Universal, Pa. (near Pittsburg), just now being completed, increasing the capacity of that plant from 1,500,000 to 3,500,000 barrels per annum, this additional plant at Buffington, when in operation at the beginning of 1911, will give the Universal Portland Cement Company a total output of 10,000,000 barrels per annum, all manufactured from blast furnace slag and limestone.

Big Contracts to be Awarded.

BUFFALO, N. Y., Feb. 17.—Cement dealers will be interested in the announcement made by the Buffalo Grade Crossing Commission on Feb. 16 that in a few days contracts for \$1,000,000 in grade-crossing elimination work will be signed by officials of the Erie Railroad and the commission here. The crossings to be abolished are on the Erie's Niagara Falls branch or belt line around this city. The crossings are at Genesee Street, Walden Avenue, East Ferry Street, Delavan Avenue, Kensington Avenue, Main Street, and Delaware and Herkell avenues.

National Association of Cement Users

Hold Sixth Annual Convention at Auditorium Hotel—Large Attendance and Great Enthusiasm Displayed—Many Interesting Papers Read.

The master brains of the cement and concrete industry were assembled in Chicago throughout the past week. The meetings of the sixth annual convention of the National Association of Cement Users, which was held at the Auditorium beginning February 21 and continuing every day until the 25th, marked an epoch in the history of concrete construction and will do more to straighten out the tangled threads and blaze the way for future achievement than any other similar convention ever held in this country. There were assembled at these conventions men who have made the subject of concrete construction a study and it was discussed from every viewpoint, the papers presented covering the widest range and will have an influence and bearing on the industry for many years to come. It would seem as if all the conventions held in the past have been but preliminary meetings leading up to and culminating in this the sixth annual, for at this convention there was more real good accomplished in the way of promulgating standard specifications and illustrating the various methods of construction than at any other convention.

Many pet theories were exploded and some of the old-time operators received severe jolts.

It is impossible to print at this time all of the papers which were delivered at the convention, but we have endeavored to give a few of those covering a wide and diversified range of subjects and will print the others in the forthcoming issue. Owing to the limited space much of the discussion will also have to be left out. President Richard L. Humphrey, just returned from Europe after a thorough investigation of the testing laboratories of the old country, was enabled to touch upon subjects which have in the past been stumbling blocks to the further advancement of the industry. It is impossible, of course, to touch upon the widespread influence which the dissemination of such knowledge and discussion as was brought out at this convention will have upon the future conduct of the concrete business as a whole.

The attendance was by far the largest that was ever gathered at any similar convention, the interest was keen and lively, and the discussions showed clearly that the delegates were aroused to the importance of the undertaking which they have in hand to a greater extent than ever before. The concrete industry has often been spoken of as being in its infancy. We can now say with all confidence that the infant is growing, and that if the interest shown in the convention is any criterion the industry will make giant strides from now on. The foundations are laid and the superstructure is now being built.

OPENING SESSION, FEBRUARY 21.

The formal opening of the convention occurred at 8 p. m., according to program.

George M. Bagby, assistant corporation counsel of Chicago, delivered a graceful and witty address of welcome, which was cordially received and roundly applauded.

President Humphrey responded in his usual earnest manner in well chosen words, expressing appreciation and reflecting credit upon the association.

Judge C. C. Kohlsaat, president of Lewis Institute, Chicago, and John M. Ewen, consulting engineer, Chicago, addressed the meeting from the standpoints of the educator and the practical engineer.

Frank R. Charles, city engineer of Richmond, Ind., had the first paper of the business session. It was entitled "Development of Concrete Road Construction." He has had considerable experience in the

DEVELOPMENT OF CONCRETE ROAD CONSTRUCTION. BY FRED R. CHARLES, City Engineer, Richmond, Ind.

The city of Richmond, Ind., cannot claim to have a large amount of concrete roadways, but it laid some of the earliest street pavements of this construction. Our first roadway was laid in 1896. It now has nearly fourteen years of life and usefulness to its credit, and is still continuing its service without having cost one cent for repairs. In truth this was a small beginning, and owing to the excellent character of its macadam streets, our city has been backward in constructing permanent pavements, but nevertheless this first concrete roadway has abundantly justified its existence, so that for the last eight or ten years the amount has been added to in a small way annually. There was nothing especially remarkable about the construction of this first pavement, except that extreme care was used in all the processes, particularly the minor ones, and I wish to state here that we endeavor in all our cement work to watch carefully the

small matters, remembering the proverb, "Perfection is made up of trifles but perfection is no trifle." Perfection has not been reached far from it—but "If at first you don't succeed, try, try again." The natural soil under this first pavement is gravel, so that no sub-base was required. The concrete was proportioned 1-2-5, deposited five inches thick after ramming, with a top surface one inch thick, proportioned 1 to 2. It was cut into blocks about five feet square and the surface pitted with an ordinary lug roller.

In the subsequent work various plans have been used. The principal variations consist in the material for aggregate, thickness of concrete, with and without a top surface, thickness of the latter, size of blocks, thickness of joints and material used therefor. One roadway was cut in blocks eight to ten feet square; another thirty to forty feet square; all joints between the blocks, both cross and longitudinal, are one inch wide and filled with paving pitch. The defect of this method consists in the chipping of the concrete edges at these joints, principally the longitudinal ones. Our experience seems to show the blocks should be as large as possible in order to reduce the number of joints, and that the joints should be as thin as can

as for most other concrete work. Place this concrete on a well prepared foundation, using suitable straight edges and templates cut to the required crown of the street; tamp or jostle to make a compact mass, leaving the surface rough to provide attachment for the top layer; cut joints through the concrete every ten to fifteen feet, and fill with sand. Before concrete begins to set, place thereon the top surface, composed of one part cement to two parts hard, coarse sand, trowel and float, cutting joints directly over those in the concrete, using a small radius "jointer" to leave as thin a joint as possible, and finally finish by means of a "float," leaving the surface as rough as possible. This gives a roadway very suitable for our use. For heavier traffic, six inches of concrete and two-inch top surface is advantageous.

We have also had good results by making the pavement homogeneous, that is, without the top surface. Make the concrete somewhat richer in cement, and quite wet. Tamp until free mortar flushes to the top, then finish with trowel and float. For this purpose the concrete should be free from large stones, as with a large stone at the surface, if one end becomes worn loose, a large leverage is afforded to tear the remainder of the stone from the concrete. As remarked before, the disadvantage of concrete is its lack of toughness, whereby exposed edges of joints and corrugations are prone to chip and wear off. For this reason joints ought to be reduced to a minimum, and especially longitudinal joints should be eliminated wherever possible. Another defect urged against concrete is its lack of elasticity. This contention does not seem to be well founded, as concrete is not the only non-elastic pavement. Brick on a concrete foundation and with a cement filler seems to be about as unyielding and non-elastic as any roadway could be. Of course, for horses some elasticity is desirable, but in view of the increasing numbers of motor vehicles, this quality is not as essential to so many users as formerly.

The present laws of Indiana, while passed avowedly in the interests of the asphalt paving industry, ought to bring about the increased use of concrete roadways. For example, plans must be made for a foundation suitable for any kind of "a modern city pavement," which foundation naturally will be concrete. Then the specifications must include, and bids be received for, four different paving materials to go on top of this concrete foundation. After receipt of bids the property owners have the right to determine which one of the four shall be adopted, and since cheapness usually appeals to the average property owner, asphalt often wins the day, because with the same foundation specified for each pavement, the top surface of asphalt can be put on at less cost than brick. Here is the chance for concrete paving. Put down a foundation suitable for any kind of pavement, viz., five or six inches in depth of concrete, mixed, placed and jointed as above suggested; then before this concrete begins to set, place thereon the "paving material," consisting of the wearing surface $1\frac{1}{2}$ or 2 inches thick, mixed one part cement and two parts sand, as before stated, and you will have a pavement that can compete with any other in price, and will cost less in maintenance, and will give a cleanly, sanitary effect, and will come as near to satisfying the "public" as you can ever hope to satisfy that exacting personage.

George C. Wright, C. E., Rochester, N. Y., read his paper on the use of concrete blocks in roadway construction.

NOTES ON THE USE AND COST OF CONCRETE BLOCKS IN ROADWAY CONSTRUCTION.

George C. Wright, Consulting Engineer, Rochester, N. Y.

This paper is in the nature of a description of a system of road surfacing which is, I think, new in this country, and is taken in the main from a report of J. M. McClintock, County Engineer, Monroe County, New York, made to the Highway Commission of New York State.

The original Macadam used to say that if one could get stone broken into cubes of uniform size of about two inches and once get them laid the ideal road would be secured. The increasing difficulty of maintaining a macadam surface composed of irregular shaped fragments of varying size under the conditions of rapidly moving motor vehicles emphasizes the importance of the remark of the father of stone roads.

The general use of Portland cement for most purposes of construction naturally leads to the thought of the possibility of taking stones as they come from the crusher in irregular shapes and square them up by means of Portland cement. The low price at which Portland cement can be secured brings the cost of such treatment within reason.

It appeared probable that if the wearing surface of a highway could consist of two-inch cubes placed closely together and made of either Portland cement with gravel or broken stone, or vitrified shale, or asphaltic concrete, or bitumilithic concrete, or iron furnace slag, that the following results might be obtained:

Comparative freedom from dust, smoothness of surface, good footing for horses and wheels, pliability permitting of changes in the base due to freezing and thawing, and movement due to the contraction and expansion. As these cubes could be supported on any suitable local stone or gravel the cost per mile for first class road would evidently be very much below that of ordinary paving brick and more lasting than any of the asphaltic or bitumilithic mixtures, and further, the maintenance would be simplified and reduced in cost.

The State Highway Commission authorized the expenditure of \$2,250 for the purpose of making a preliminary demonstration, with the following results:

On the Ridge Road northwest of the City of Rochester the original trap rock surface two inches thick was worn completely off at the center and nearly so at the sides of the 16-foot macadam roadway, leaving exposed good



RICHARD L. HUMPHREY, PRESIDENT NATIONAL ASSOCIATION CEMENT USERS.

be made. On the other hand, we find that blocks ten to fifteen feet square are about as large as can be made without developing temperature cracks in our climate. These latter, however, apparently do not injure the pavement, beyond detracting from its appearance, as cracks that have existed for years show no enlarging, and the pavement up to and over the cracks is as solid as elsewhere.

Possibly there have been such experiments, but I have no knowledge of them, to ascertain what size of blocks are safe in different climates, or places with different range of temperature. Corrugating or grooving the surface is objectionable for the same reasons as are the joints; the edges of the grooves afford an opportunity for the concrete to chip and spawl off by the action of horses' hoofs, etc. Also the grooves catch and collect the dirt, interfering with the cleanliness of the pavement and rendering it more difficult to sweep. Possibly the corrugations afford slightly better foothold for horses, but I think even here the advantage is exaggerated. We obtain a very good surface by using one part cement to two parts hard-grained, coarse sand, screened through a No. 4 screen; troweled down to remove all holes, air spaces, etc., and "raised" with a cork or wood float, giving a rough, gritty surface, on which horses can maintain their footing as securely as on a cement-filled brick, an asphalt, or wooden block pavement when damp. For ordinary traffic pavement we find excellent results are secured by the use of five inches of 1-2-5 concrete, and a top surface one and a half inches thick, mixed 1 to 2. For automobile travel nothing could be more satisfactory. Of course it is trite and unnecessary to say that care must be used in selecting good aggregate material, proportioning properly to reduce voids to a minimum, and securing good workmanship in all the operations of mixing, placing and finishing the work.

I am a firm believer in "wet mix," for this, as well

solid lower course of rather large size broken Medina sandstone, resting on a good gravelly foundation.

The existing surface was somewhat rough and knobby, and over this was spread as thin a layer as possible of screened gravel, which was rolled down with a 12-ton roller, so that in spots it was two inches thick and in other spaces over the knobs it was no measurable thickness. The resulting surface had a crown of about four inches in 16-feet width.

On this bed so prepared was placed directly a wearing coat of 2-inch tubes for a width of fifteen feet, being laid close together by hand, the edges being held up temporarily by 2-inch planks laid lengthwise with the road. On the cubes was spread a small amount of fine, somewhat loamy, gravel, which was broomed in, after which the heavy roller was slowly passed over the whole of the surface forcing the cubes to take a full bearing on the supporting gravel. The edges and roller wheel was supported by the planks, then the side-planks were pulled up and moved ahead and coarse gravel $\frac{3}{4}$ " to $1\frac{1}{2}$ " was placed along the sides next to the cubes on the shoulder for a width of about 2 feet. Outside of this a finer gravel was spread, feathered off to a width of about three feet, more of the fine loamy gravel was spread on the top and broomed and flushed in until the space between the cubes was thoroughly filled, the gravel on the shoulders was wet and the whole surface thoroughly rolled with the heavy roller.

A stretch of road 1,800 feet long was surfaced with cubes. On 1,600 feet Portland cement gravel concrete cubes were used, on 200 feet vitrified shale cubes $2\frac{1}{2}$ " in size were used. For a strength of 100 feet a concrete sunken curb 6 inches by 9 inches in dimension was used in place of the gravel shoulders. On 100 feet in length the joints between the cubes were filled with Portland cement grout instead of the fine loamy gravel. For 60 feet on which the joints were filled with the fine gravel, light asphaltic road oil was sprinkled over. A machine for making cubes which is an adaptation of the ordinary cement brick machine was furnished. This machine made 68 cubes at one operation, resting on a wooden tray, and the tray was carefully placed on a drying rack without disturbing the freshly made cubes. The cubes remained in racks twenty-four hours and were then dumped in a pile. This pile was thoroughly sprinkled twice each day.

The number of cubes made was about 7,000 upon the first day, but within a few days the same gang was able to make with ease 26,000 of the cubes. Various sizes of screens were tried from $\frac{1}{2}$ " to 2", but it was found that the $\frac{1}{2}$ " screen gave a product that could best be handled in the machine. Experience showed that the concrete had to be rather dry in order to avoid settling and bulging of the cubes before the concrete set. Seven men and a foreman did all the work. The amount of cement used averaged $2\frac{1}{10}$ barrels to a cubic yard of concrete. The area covered with cement cubes was 2,652 square yards upon which was laid all of the 730,000 cubes manufactured, except about 5,000 kept for repairs. The cost of cement cubes laid was as follows:

Cement 6.088 barrels.....	\$0.121
Cost of factory.....	0.107
Labor of manufacture.....	0.161
Gravel, 50¢ per c. y.....	0.024
Carting.....	0.027
Laying.....	0.072

Total cost per sq. yard laid..... 0.512
There was placed on shoulders 219 c. y. of gravel covering 1,800 square yards, costing \$2.12 per cubic yard rolled in place, or 26 cents per square yard.

In considering these figures as the basis for estimating cost it is obvious that there might be reductions made in cost of cement by using a reduced quantity, and in reduced cost of carting, the cost of the factory might be disturbed over many more square yards, the cost of labor by use of concrete mixer and other labor-saving devices, the cost of gravel in pit is usually nearer 10 cents per cubic yard than 50 cents which was paid here. The cost of laying was very much reduced as the men became experienced, and this could be still further reduced by paying for it on the basis of piece work.

C. W. Boynton, chairman of the committee on roadways, sidewalks and floors, who had worked out the report of his committee in the afternoon, was called upon to present the proposed amendments to the standard specification previously adopted by the association. Mr. Boynton joined the president on the platform and the amendments were taken up by paragraphs. The subject matter is one of the greatest importance, and Mr. Boynton has worked faithfully for the most practical specifications during his long and efficient service as the chairman of this committee. There was more than the usual amount of discussion which was always brought out upon these topics, and the hour of midnight arrived before the specifications were completed. By agreement the matter went over to Wednesday at 2 p. m. for completion.

MORNING SESSION, FEBRUARY 22.

At 9 o'clock Tuesday morning in the Convention Hall of the Auditorium Hotel, President Humphrey called the second day's session to order. Both the size of the attendance and the enthusiasm displayed promised an interesting meeting.

After a few preliminary remarks the president announced the meeting of the Section on Concrete and Reinforced Concrete followed by a general discussion. Particular attention was paid during this general discussion to the selection of materials, methods of construction, and costs.

Mr. Olaf Hoff, the New York consulting engineer, then read a most interesting paper on "Laying Concrete Under Water," as Mr. Hoff explained, the chief difficulty among the many presenting themselves seems to be the conveying of the mass of semi-fluid concrete mixture through the water to its place of deposit in such a manner as to preserve the mixture intact and prevent aggregation of its integral parts, which would leave only an inert mass of aggregate. Mr. Hoff went on to say that as far as he

has been able to learn, the most satisfactory method of any tried to date has been the use of tremies. Mr. Hoff very aptly illustrated his point by describing the construction of the Detroit River Tunnel, which was completed by this method. The paper was well given and was heartily received by the audience.

The program promised an address on the "Comparative Value and Cost of the Groined Arch in Large Reservoirs," by T. H. Wiggin, Senior Designing Engineer, Board of Water Supply, New York, but Mr. Wiggin was unable to be here on account of sickness.

Cloyd M. Chapman, Engineer in Charge, Westinghouse, Church, Kerr & Co., New York, then took up the subject of "Water Proofing Concrete." The consensus of opinion seemed to be that water-proofing was only an attempt to remedy a poor job of concrete laying and that if the concrete is properly made, it requires no water-proofing of any kind.

THE PREPARATION OF CONCRETE: FROM A SELECTION OF MATERIALS TO FINAL DEPOSITON.

Harry Franklin Porter, C. E., Consulting Concrete Engineer, Bridgeport, Conn.

The preparation of concrete is an art requiring every bit as much exact knowledge, experience, skill and painstakingness as the preparation of steel. It



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is if anything a more difficult art than steel making, for while the latter is carried on under fixed conditions and everything favors reduction of the process to a science, the preparation of concrete seldom takes place under conditions twice alike. In the first place, the materials themselves vary greatly, from place to place, and from time to time, differing in composition, quality, size and grading; and in the second place, the assembly of the various materials that go to make up the composition of concrete, and their final deposition as concrete, involves continual readjustment of the modus operandi. To prepare concrete properly, therefore, it becomes very necessary:

(1) To make a careful investigation of available materials before each and every use, involving an analysis to determine fitness and a synthesis to fix upon proper proportions to ensure the desired results;

(2) To see that every reasonable precaution is taken, in the several operations incidental to installation, to insure proper handling of the materials, both before, during and after intermingling, until the finished product is in place; and thereafter to see that it is left to solidify under the most favorable conditions possible.

Formerly, and now yet in some quarters, the notion prevailed that, "even as a nail could be made from any old piece of iron" and "a soldier from a good-for-nothing," as the Chinese proverb has it, so concrete could be made out of any old materials by anybody, anywhere, at any time, provided only a sufficient amount of good Portland cement were used. How absurd! That no idea could be more fallacious, those most familiar with the practice are now agreed, but it has taken much sad experience to enforce the lesson; and it will probably take considerably more such before the lesson is fully, finally and universally learned. Indeed, those who have had the widest and deepest experience with concrete are of a mind that the preparation of this product, so far from being one of the simplest and easiest propositions, is one of the most complex, and that no large-scale process under human supervision requires a higher order of intelligence and skill. Agreed also are they that, in no other building art at least, is eternal vigilance so much the price of success, nor practical ability at so high a premium. Concrete construction is of all construction the most practical; it is a success or a failure just as the element intelligence is present or lacking in any or all of the details of preparation,

from the selection of materials to the final deposition in the molds.

In order to undertake successfully—and successfully means intelligently—the preparation of concrete, it is of course first necessary to understand clearly the principle involved.

It may be stated as the chief aim of concrete-preparation to secure as dense and homogeneous a mass as possible, by which it is meant that there shall be the closest possible contact between particles, and that the particles shall be so sized as to reduce the contained voids to a minimum.

To secure a dense concrete is not commonly stated to be the purpose, but a strong and durable concrete, or rather a "good-enough" one. As a result of these and similar misconceptions of the primary object, we find people trying to make strong concrete out of "good-enough" concrete by the simple addition of cement, in other words, measuring the quality by the proportion of cement to other ingredients, richness in cement being regarded as compensation sufficient for any and all other deficiencies; and trying to make waterproof concrete—which is dense concrete—by the addition to "good-enough" mixtures of divers patent waterproofing compounds. These practices are on a par with gormandizing to get strength and dosing with medicines to correct errors in living. Doctoring up concrete mixtures today has reached a popularity only paralleled by the patent specific craze a few years ago; and, I dare say, the same type of human nature that catered to it, is catering now to the concrete craze; at any rate that parallel extends to the same order of prolificness and vividness in advertising. The writer is of the opinion that even as an ounce of common sense is worth a ton of so-called cure, as regards living, so in the preparation of concrete, if proper attention is given to securing as dense a mass as possible, through the scientific grading of the inert, abundant strength can be had with a minimum of cement and imperviousness equal to keeping out a Jamaica hurricane.

Nor do efforts spent in the direction of enhancing the density increase, necessarily, the cost; as a matter of fact, regarded even from the standpoint of first cost—always a deceiving quantity—enhancing the density decreases the cost, whatever expenditure entailed by the investigations to determine a scientific sizing of inert, and in practice to realize the result of the finding, being more than compensated for by the saving in cement alone, to say nothing of the economic value of a concrete at once denser, stronger, more durable, and practically waterproof.

The primary object, then, of concrete making is well stated—to secure maximum density.

To secure a dense concrete two things are necessary:

(1) To effect, by the manner of sizing and proportioning the inert, a maximum reduction of voids;

(2) To fill all the pores, interstices, or voids remaining after the reduction as above with an elastic, insoluble, and tenacious substance, which must first have the property of a liquid, so as to flow freely into place, secondly that of a glue, to unite all particles into a homogeneous whole, and thirdly that of becoming itself hard and stonelike.

It is not possible, no matter how carefully and to what minute extent the grading of inert is carried, to therewith alone eliminate virtually all voids, any more than it is possible, in the familiar illustration in geometry, to divide a rectangle until there shall be no more to divide.

Various inert, as they come for use in concrete mixtures, have voids roughly as follows: broken stone, one size, 50 per cent; broken stone, two sizes, not greatly differing, 45 per cent; gravel, one size, 50 per cent; gravel of indiscriminate sizes as found naturally, 30 to 40 per cent; natural sands, 30 to 40 per cent; artificial (crushed stone) sands, 35 to 45. Thus, on the average, inert—as they come naturally to hand—have from one-third to one-half of their volume air-space, or voids. Ordinarily, by combining broken stone or gravel with sand, in certain proportions, usually about two volumes of the former to one of the latter, it is aimed to reduce these voids, not "entirely" or even "as much as possible" or "advisable," but only "somewhat." This "somewhat" may reach as low as 15 per cent, if haply the finer inert—the sand, are particularly well graded naturally; more often it is not less than 25 or 30 per cent. The balance, whatever it may be, is then offset, as best may be, with cement. A typical specification for such a mixture would read:

"The voids in the coarse aggregates are to be filled by an equivalent volume of fine aggregates and enough cement is to be supplied to fill the voids in the fine aggregate with (say) 10 per cent excess."

Or it might be stated more simply and specifically yet:

"The concrete is to be proportioned one part by volume of cement, to two parts sand, to four parts broken stone."

Of these two specifications, both of which are typical of average practice, the former is the more scientific; but neither are scientific enough to insure consistently good results. The object presumably we are after. In the first place, statement of the proportion of cement by volume measurement is exceedingly slipshod, for it ignores the fact that cement dry from the bag, cement packed down, and cement mixed with water, have volumes respectively that differ widely, and that it is the volume of cement with its requisite water that should be taken into consideration; secondly, that there is no accurate or real distinction between coarse inert and fine; and, thirdly, that actual voids in inert are a very variable quantity, differing practically, not only with every job, but from day to day on the same job, even from hour to hour.

It is some improvement to state the proportions, as many engineers are now doing, as one part cement to so many parts inert, making no longer a distinction between fines and coarses. But this even is not enough. A specification to be proper should state, firstly, the maximum size of inert allowable; secondly, the maximum voids; and, thirdly, the quantity of cement paste necessary to effect a final filling of the voids and fulfill the requirement of a binder for all particles.

The maximum size of inert, that figures in the mixing of the concrete proper, is fixed usually by the conditions of practice; it is of advantage to have it as large as practical, since the larger the individual volume of the inert the less, relatively, the superficial surface to be coated with binder. This follows from

the fact that, whereas the volume of solids increases as the cube of the diameter, the surface increases only as the square. Three considerations, at least, work to limit the maximum size inert:

- (1) The incorpability: no particles should be used in the mix proper that will not readily merge with it;
- (2) The width of members that are to be cast;
- (3) The location and spacing of the reinforcement.

By the first consideration the size is limited to about 2 inches; and by the other two, on occasion, to as fine as $\frac{1}{4}$ -inch, and seldom, in reinforced work, is larger than $\frac{3}{4}$ -inch practicable. Two-inch stone, even, are not easy to mix, and it is probable, for best mixing, not larger than inch to $\frac{1}{2}$ -inch should be used. Other grades of inert are then to be supplied of such sizes and amounts as to effect a maximum reduction of voids. It is entirely possible to reduce the voids to 10 per cent and even less; but probably 10 per cent is a practical minimum. To fill the remaining voids cement must be largely relied upon.

Not many sizes of inert are needed. Suppose the maximum is fixed at 1-inch; then, as it has been found experimentally and as it may be demonstrated analytically, the next size smaller should be, in order to fit easily into the voids of the maximum size, approximately one-fourth as large, that is, in this case, $\frac{1}{4}$ -inch, and there should be about half as much of them; the next size should be approximately one-quarter of the second, viz., $\frac{1}{16}$ -inch, and a volume of them equal to one-half the second size or one-fourth the first; and so on, down to impalpable dust; but probably there will not be more than four or five grades altogether, the finest grade comparing with cement in fineness—finer than which it is scarcely possible to go.

This law of grading, if represented by a curve, would assume the form of a parabola, having its origin at the intersection of zero size and zero proportion, and approaching coincidence with the horizontal at the intersection of the 100 per cent ordinate and the maximum size abscissa. It will be found of this parabola, that the intersection of the 50 per cent ordinate and one-fourth-the-maximum-size-abscissa, and the intersection of the 25 per cent and the $\frac{1}{16}$ -inch size, and so on outlined above, will fall in or near it.

By use of such a curve, and the separation of a combination of inert proposed for use into several grades down to dust, plotting the results alongside the standard curve for comparison, the deficiencies can be at once recognized; whence the extra proportion of any one or more sizes, or the proportion of a size not present, may be readily calculated, and the deficiencies corrected.

If there is an excess of coarse stuff the curve will be too flat; if an excess of fine, too high. An excess of fine particles is particularly objectionable, in that they crowd the cement grains and prevents their working properly; moreover, it requires an excess of cement, over and above a properly graded aggregate. An excess of cement is also required when there is an excess of coarse stuff; but, unlike the other condition, there is no crowding of grains; the cement still does not function properly, in that it is congested in the large voids instead of being distributed in thin films and fine points, forming, as it were, an interlacing meshwork, entwining all particles, but this condition is not so bad as the former.

Best results obtain when the grading is uniform, from maximum to dust, but with no more than 10 per cent of the finest grade, which approximates the cement in size and may be regarded as replacing so much of it as finest filler. The cement, then, when made into a liquid with water, will have only to coat all particles with a thin film and to bridge the few small remaining interstices. Nothing but a liquid can perform this office; this is an important point and will be dwelt upon hereinafter.

Another point: It is well not to have the sizes too close together, as, for instance, to have a mixture of inch and $\frac{1}{4}$ -inch stone, for the reason that the $\frac{1}{4}$ -inch will crowd the inch, preventing it from assuming the most compact form; in fact, even so large as $\frac{1}{2}$ -inch will crowd the larger size; the desideratum is, (1) that the maximum size should be free to assume its most stable configuration, which is when all particles are in as close contact as possible; and (2) that the next smaller size should just be large enough to neatly fill the maximum interstices. Similarly, the next smaller size should be such in dimension and amount as to effect a complete filling of the next largest interstice; and so on.

If this law of grading is observed, it will be found that the final volume about equals the original volume of the maximum size, and that mixture will be the most dense of which this is the nearest true.

This points a practical way to determine upon the best proportions—to wit, to try a number of different combinations of the materials available, and to use that one which gives the least volume, or the one nearest the size of the volume of the maximum size particles alone.

The sufficiency of fine particles, and of the cement, may be simply gauged at the same time (provided complete mixtures are prepared, as is indispensable to accurate gauging even of the inert, for the particles—no matter how well graded—are not free to slip and slide into the position of maximum stability (closest contact) until assisted by the lubrication of the cement cream). These may be gauged by the appearance. It is an indication of sufficiency of fine material when the voids in the coarsest material are just filled, such that when tamped lightly with the foot a soft mush flushes to the surface; and it is an indication of sufficiency of cement when this fine material presents a smooth, glossy appearance; that concrete mortar is the densest which is the smoothest appearing.

Needless to state, almost, the test mixture should be so soft as to quake like a jelly, and be ready to flow, for the above indications as to quality to be apparent. Similarly, during the deposition of concrete, if it is of a proper liquid or semi-liquid consistency, the trained eye of the foreman or supervisor can keep track of the quality of his mixture almost as accurately as an automatic proportioner, supposing there were such an instrument. As a matter of fact, there is no satisfactory substitute for the trained eye of the installator, nothing that can detect so quickly and accurately any variations in the composition of the mixture, as occur often many times in a single day on the average concrete job, due sometimes to variations in the material, again to mistakes of the workmen.

Another way to gauge the accuracy and sufficiency of the grading is by weighing. That mixture, obviously, which weighs the most relatively is the densest. If the

solidity of the concrete were absolute, that is, if the voids were completely filled, its weight would be in the neighborhood of 165 lbs. per cubic foot, if the inerts were of quartz, 170 if of limestone, and 180 if of trap. A quartz concrete; thus, that weighed close to 160 lbs. would be about as dense as it would be possible to make it. A few pounds always are to be allowed for shrinkage, say 2 per cubic foot for moderately wet mixtures, so that if measurement and weight are taken wet, this correction should be applied before estimating the density. There will be a loss, too, by evaporation, to take into account, if the concrete is to be allowed to harden freely exposed to the air; if wet-blanketed, there will be practically no loss from this source. A weight of 160 lbs. for a quartz-concrete, hardened under favorable conditions of wetness, with shrinkage allowed for, can scarcely be improved upon; it means a solidity of 97 per cent, or a reduction of voids to 3 per cent. A concrete this dense will be found practically impervious to water, even under considerable head, indeed to the limit of its strength. What more could be asked? And can the admixture of any special compound show results superior?

The size of inert is not necessarily limited to the maximum stated; if conditions permit as large stone as it is convenient to handle may be intermingled with the mass, so long as there always is an abundance of concrete—which in this case may be regarded as a coarse mortar—to completely cover them. Such stone may be called, to distinguish them from ordinary inert, *bulk-swellers*.

Bulk-swellers should not be less than four diameters larger than the largest inert, and preferably still larger, in order that there may be no doubt as to the fine materials slipping into the voids, in case especially if the volume of bulk-swellers is sufficient to cause the concrete proper to occupy the relation to it of a void-filler; but they should in no event be less than four times larger, lest they act merely to displace

atmosphere likewise; cubical or square-faced blocks are less desirable than irregular or well-rounded ones, for square edges act like so many wedges, tending to cleave the mass, as in hardening it shrinks around them. Rounded stone, on the other hand, imbed themselves more naturally, the mass in shrinking tending to conform to their contour; irregular shapes tend to key themselves in, and to prevent, rather than induce, cracking. Flat stones are less desirable even than cubical ones, as their tendency to induce splitting is still more pronounced. These objections on the score of shape constitute in fact the greatest drawback to the use of large bulk-swellers.

An interesting example of the use of large bulk-swellers is afforded in the construction of the piers and abutments for the new concrete arch bridge across the Rocky river, at Cleveland, which outranks the famous Walnut Lane bridge, spanning the Wissahickon in Fairmount park, Philadelphia, both in span and in height. In this instance huge chunks of rock, as large as could be swung into place with a derrick, were introduced into the mass at frequent intervals, being first cleaned, dusted and wetted. Advantage was taken of these stone at the conclusion of any period of operation, when there was to be a break of some little duration, by placing them so that about half protruded, thus providing an admirable key for the subsequent work. It is an interesting fact that, although frequently square-faced stone were used, no unfavorable shrinkage action showed itself; which would indicate that most of the shrinkage takes place while the concrete is still plastic enough to conform to the rigid outline of the contained block without separating. Hence the tendency to induce cracks, as pointed out above, may not be so serious a matter as oftentimes might be supposed.

There is another advantage in the use of bulk-swellers of irregular shapes especially—rounded ones larger so—namely, that they act also as reinforcement, forming here and there, throughout the mass, so many rigid keys locking the parts together, and in this way enhancing, no doubt, both the compressive and tensile strength—if not very much in the long run, at least an appreciable amount on short time. Of course, just how much strength will be added in this manner depends largely on the character of the stone itself. This enforces the necessity for a good quality of stone, always, for concrete mixtures.

Bearing on this point, investigations made in connection with one of the bridges recently constructed by the city of New York, to ascertain how the strength of concrete might be increased so as to act as an adequate filler and stiffener to some cast pedestals, are of interest. It was found by the addition of a certain number of cut nails or spikes per cubic foot of concrete the crushing strength, and the tensile correspondingly, was increased enormously, one series of tests giving results as high as 18,000 lbs. per square inch, or nearly eight times the ordinary strength.

Similarly, by the plentiful intermingling of large, irregular-shaped, more or less elongated, tough bulk-swellers to a mass of concrete, it would appear that the strength must benefit no slight amount. In reinforced concrete work, especially, this principle might well be taken advantage of, providing of course conditions are favorable to it, to the end that the concrete act further with the steel to resist tension, thus increasing the actual strength of the whole member. Indeed, it is not at all improbable that, in the not very distant future, reinforcement of this nature, that is, supplying resistance to particles throughout the mass, by introducing here and there short pieces of steel, on the tensile side especially, will come into use, thus making concrete a more truly homogeneous structural material. The same principle might also on occasion be taken advantage of in columns, in order to keep down the girth and avoid the necessity of steel cores.

All concrete may be looked upon as a combination of mortar with bulk-swellers. Thus the conventional 1-2-4 mixture might be regarded as composed of one part 1-2 mortar and four parts bulk-swellers. The correctness of the rule as to the proportion of the bulk-swellers allowable—to wit, a volume of them equal to twice the volume of fine material—is now apparent. What, then, it may be asked, is the practical use of regarding the bulk-swellers separately? Just this, that they play no vital part in the proper balancing of the inert from coarse to fine to secure a dense concrete—it is the fitness, largely, of the mortar in any concrete that determines its density.

This would indicate the feasibility of a standard concrete mixture, one which might be used for any and all purposes, differing only in the proportion and size of the bulk-swellers added. It would be only necessary to agree upon the most suitable and convenient maximum size inert in the concrete proper. Larger than one-inch would scarcely be possible, as already pointed out; probably 1-inch or $\frac{1}{2}$ -inch would best satisfy general requirements. The preparation of good concrete, then, would resolve itself down to the selection of suitable finer grades of material to compare with the maximum grade determined upon, even according to the diagram of grading hereinbefore outlined. Efforts in the direction of economy in this case, instead of expending themselves in such unworthy ways as skimping the cement, would be confined to improving the grading (which truly economizes on the cement by decreasing the amount it required to produce a given result, not to mention the many other advantages of a scientifically graded mixture), and to incorporating with the mass, either during mixing or thereafter, as many and as large bulk-swellers as conditions favor and judgment approves. If bulk-swellers are added during the mixing, they should be held out until the rest of the material is pretty well intermingled. No specific limit need be set as to their amount relative to a stated volume of fine material (as measured mixed), except to rule that no more of them shall be added than can be readily incorporated. An approximate ratio has already been given, but this may not always indicate the true proportion, more or less; judgment on occasion is the best guide.

There remains to discuss the functioning of the cement, about which, apparently, there prevails much misapprehension. Just what does the cement do, and how does it do it? These are common questions which demand specific answers.

What is known to the trade as Portland cement is a mixture, partly chemical and partly mechanical, of lime and silica in certain well defined ratios. Pure Portland cement would consist, according to Professor Newberry, wholly of tricalcic-silicate, $3 \text{ CaO} \cdot \text{SiO}_2$;



ROBT. W. LESLEY, PHILADELPHIA, PA., PRESIDENT AMERICAN CEMENT CO.

which compound may be regarded either as a chemical combination or as a solid solution of lime and silica, even as brine is a solution (but a liquid one) of salt and water. Practically Portland cement contains several other compounds besides the tri-calcic silicate. In the first place there will be analogous aluminates and ferrites, and magnesium silicates, aluminates, and ferrites; and in the second place some of the lime and silica will not be combined at all. One has but to feel a cream of cement to detect the presence of uncombined silica. Of course it is aimed to keep these other compounds present in as low amounts as possible, especially the magnesia, more than 5 per cent. of which is considered harmful and is prohibited by the specifications. Alumina and iron are less objectionable, and, while adding perhaps little or nothing to the cementitious value directly, they serve a valuable purpose as a flux in calcination, greatly facilitating the combination of the two essential compounds—lime and silica. It is aimed to use no more iron and alumina than absolutely necessary to a satisfactory flux at normal kiln temperature. Again, not all of the lime and silica, nor of the analogous compounds, are combined in their trivalent form—there is generally some formation of bivalent compounds, such as $2\text{CaO} \cdot \text{SiO}_2$, the value of which in the product is not definitely known; the higher the temperature at which clinkering takes place the more likelihood that only the trivalent order will be formed; and the more trivalent calcium silicate formed the better the cement. Taking all these factors into consideration, probably, of the average first quality Portland cement, not more than 75 per cent has any real cementitious value; the balance represents so much inert matter.

Tri-calcic silicate, assuming it to be the essential compound, is only potentially cement; it is not actually cement until after its union with water. The dry powder—marketed as Portland cement—is in truth no more cement than the water with which it is finally combined. The two substances occupy the same relation to one another as does nitric acid to glycerine, neither of which alone has any explosive value, but together—as nitro-glycerine, or dynamite—they form a very powerful explosive. The real cement, then, is the compound that results upon the addition of water. It is composed of calcium, silica, and water (H_2O), so combined as to form a very stable compound. Tricalcium silicate itself is a very unstable compound, being heavily surcharged with basic valencies. Calcium is basic, silica acidic; water also is acidic, in the part that it plays in chemical reactions. We have this, therefore, as the result of the interaction of ultra-fine silica and water, in order to produce a stable, neutral substance:

$3 \text{Ca} + \text{SiO}_2 + x \text{H}_2\text{O}$, the proportion of water being such as, with the silica, to just equalize the lime chemically. Six molecules of water combined with one of silica will approximately balance, in molecular weight, three molecules of lime; that is, $3 \text{CaO} = \text{SiO}_2 + 6 \text{H}_2\text{O}$. ($166.8 - 60 + 107.4 = 167.4$)

This compound, which may be known as calcium hydro-silicate, or hydrated silicate of lime, in solidifying out from a heavily concentrated solution at moderate temperature, assumes a gelatinous condition. Lesser compounds present form crystals, which intersperse themselves in the jelly like so many splinters in a dab of glue, and add little if any strength to the mixture. Moreover, they are more or less soluble, whereas the jelly, once it has hardened, is virtually insoluble. This jelly, or gel-colloidal hydro-calcium silicate—is the true cement. It is indeed a mineral glue. Coating all particles and filling all voids, on hardening it contracts drawing all parts into the closest possible relation and forming a dense, impervious, homogenous solid. For our knowledge as to the formation and action of this gel, we are much indebted to the German analyst, Dr. W. Michaelis, Sr., whose painstaking inquiry into the nature of cementitious action covers the better part of a lifetime. Dr. Michaelis has always contended strongly for the mineral glue theory; now practice seems about to bear him out.

The importance of having a densely graded aggregate, in the light of the mineral glue theory, assumes added weight; also the futility of cement as a filler merely gains greater emphasis. Cement as a glue is scarcely more potent as a filler of large voids than is ordinary glue to compensate for unevenness in two boards; and even as in the case of ordinary glue the greatest adhesion is developed when the layer of glue is the thinnest, or—which is the same thing—the contact of the two surfaces is most perfect, so in concrete the greatest strength is secured with the most densely graded aggregates, requiring a minimum of cement.

To promote the formation of colloidal calcium hydro-silicate, then, becomes of paramount importance in the preparation of concrete. Not only is this compound, once hardened, practically insoluble, but, being a gel, it effectually seals all pores, thus making the mixture impervious.

The formation of hydrogel, as this compound may briefly be known, is most promoted by heat. It is also promoted by agitation. It is seriously retarded by cold and excessive wetness. Indeed, at low temperatures or from weak solutions, the colloidal form is scarcely assumed at all, inferior crystalline shapes asserting themselves. These facts indicate the conditions that should surround the preparation of concrete. Evidently, in the mixing, the agitation should be very thorough, in order that the water and cement powder may be brought into closest possible contact, but there should be very little heat, least premature hardening ensue, heat very greatly accelerating the action. Hence, if heat cannot be conveniently avoided in the mixing, as it scarcely can on a hot summer's day, some measures become necessary in order to delay the hardening. A good way is to make the mixture over-wet; another, to cover the freshly mixed material as it is transported from the mixer to deposital with wet cloths (burlap is excellent for this purpose). Also the completed work must be awninged to shield from the direct rays of the sun, and as soon as hard enough to bear it, wet-blankedeted, with moist rags, sand, sawdust, or some similar material. Otherwise, the surface will harden so much faster than the interior as to seriously warp and twist the mass, perhaps also crack it. It is of the greatest importance that hardening should take place uniformly.

If, after the molds are filled, heat could be applied so as to raise the temperature of the mass evenly throughout, the formation of hydrogel would be

markedly promoted, and the hardening go forward thereafter with great rapidity. But, ordinarily, such a measure is practically impossible; moreover, it is not nearly so necessary in warm weather as in cold, in late spring, summer, and early fall as the rest of the year.

When the temperature falls below 40° F ., the formation of hydrogel, no doubt, scarcely takes place at all; neither, for that matter, does crystalline formation, what crystals that may form being probably flat and polygonal, rather than slender and needle-like, and of little value cementitiously; but the very chemical activity engendered by the contact of the two affinities—water and cement powder—however incipient, generates some heat and thus promotes the formation of needle crystals and colloids.

If, however, concreting is to be carried on in the neighborhood of freezing point, it is not enough to lower the freezing point of the water, by the addition of salt or calcium chloride, as is commonly practiced; it is quite necessary that heat be applied in some manner to the concrete after placing, sufficient to raise the temperature of the whole mass to a point where favorable formation of hydrogel can take place. This temperature should not be less than 40° F ., and perhaps a minimum of 50 to 55° should be stated; at any rate, vigorous action does not set in until 75 to 80° F . is reached. Such a temperature, of course, is scarcely possible of realization in practice, except the outside temperature itself be as high; but it should be approximated as closely as possible.

There are a number of methods in vogue for heating the concrete in cold weather, but it is beyond the scope of this paper to go into detail with regard to them, and one or two only will be given cursory mention. Perhaps the most efficient, certainly the most elaborate, on record, was that used in the construction of the Butler Bros.' mammoth new warehouse in St.

is then placed in a steam kiln, where three days' exposure to the moist hot air produces hardening equivalent to thirty days under ordinarily favorable conditions outside. Pauly's tile come out straight and true, are as smooth almost as if they had been glazed, possess crushing strength superior to the burnt-clay product, are impervious even under pressure, although their walls are very thin, and will endure heating to white heat and sudden cooling without cracking or disintegrating; all of which is remarkable, and can only be explained on the basis of an extraordinary formation of hydrogel which must be realized in this process, by which the whole mass is virtually made one.

Mr. Pauly, in originating this process, has, unwittingly perhaps, stumbled on the great secret of concrete making.

The writer once had an experience which can only be explained on this basis also. A batch of concrete which had been revolving in the mixer for several hours, instead of being discarded as ordered, was delivered to the floor; there it was intercepted and cast aside, on top of a finished portion of the floor. The next day this material had set up harder than any of the rest and clung so tightly to the old concrete as to require painstaking picking to remove; moreover, it presented a much smoother and denser appearance. The result in this case was brought about, not by heating, but by excessive agitation whereby the cement and water were brought into very intimate contact, thus promoting the formation of hydrogel. The great trouble with concrete ordinarily is that it is not mixed near thoroughly enough. The value of thorough mixing is precisely that of thorough stirring of cake dough, which every artist of the cuisine recognizes, and even as good cake cannot be made from insufficiently stirred dough, so good concrete is impossible without thorough agitation. The importance of using sufficient water to make possible this thorough mixing, and the fallacy of dry mixtures, are also hereby clearly emphasized.

There are other things that contribute in degree to the strength of concrete mixtures, as for instance the amalgamation of uncombined lime in the cement with silica in the inert, or of uncombined silica with lime, either a part of the inert or introduced purposely, both of which combinations are promoted by heat and agitation. The compound thus formed is also hydrogel, a formation of which always takes place when lime and silica, in finely powdered condition, are brought together in solution. This points the way to the value of hydrated lime used in conjunction with Portland cement in concrete mixtures; there is always considerable excessively fine silica present, some in the cement itself, other in the inert; by adding, therefore, a proportion of lime hydrate some of this silica can be combined to increase the formation of hydrogel. The value of limestone dust, mingled with the inert primarily for the purpose of perfecting the grading, is also hereby indicated, the lime uniting with the silica in the presence of water to form of itself a cement, improving the adhesion and decreasing the permeability. This same fact affords an explanation of the superior strength (but not permanence) of limestone concretes sometimes noted.

It is the writer's belief that all concrete mixtures would be improved by the addition of a proportion of powdered lime hydrate, but he is not prepared to say how much, or what proportion of lime may be used as compared with the proportion of cement. L. C. Sabin, United States government engineer, reports the results of certain experiments made under his direction whereby the replacing of a quarter of the cement with hydrated lime, so far from diminishing the strength, increased it nearly 100 per cent, besides increasing the impermeability, and the replacing of so much as 50 per cent was found to increase the strength half as much, or nearly 50 per cent. These are valuable indications, and in the light of the present context appear entirely reasonable.

Hydrated lime, at any rate, aside from the question whether or no it enhances the strength, certainly is a valuable adjunct to waterproofing; indeed, if any compound is to be added to the mixture for this express purpose, it is doubtful if there is anything superior to it.

As to whether solidified calcium hydro-silicate is the final product of hardening, it is difficult to say; probably the eventual is a conversion of all the lime into carbonates, by absorption of carbon dioxide from the air, or from the contained water in solution, and of all silica (also iron and alumina) into hydrates, the strength continuing to increase until the conversion is completed.

The morning session was here adjourned until the afternoon when more time could be given to the general discussion that would necessarily follow Chairman A. E. Lindou's Report of Committee on Concrete and Reinforced Concrete.

AFTERNOON SESSION—FEB. 22.

The promised discussion was forthcoming, for from the time that President Humphrey's gavel announced that the afternoon session was in order, a rapid fire series of questions and answers was passed with Prof. Talbot, of the University of Illinois, and A. E. Lindou as the answerers of all questions. The subject of hoop columns was exhaustively delved into. After a most interesting session, the President adjourned until the evening.

EVENING ONE OF JOLLITY.

With music, songs and stories to relieve the members from the general feeling of seriousness that had so far prevailed, the evening session turned out to be a celebration of the birth of George Washington. President Humphrey discovered a most interesting book, "Experiments and Observations of Calcereous



L. V. THAYER, CHAIRMAN MACHINERY AND APPLIANCES COMMITTEE.

Cements," by Br. Higgins, M. D. This book dates back to the day of the immortal George and bears the signature of the famous man at the end. Mr. Humphrey considered the book as evidence that George Washington considered cement for the building of the Chesapeake and Ohio Canal. It was even said that as he foresaw the other vital happenings of the coming years so did Washington foresee the ever coming value of cement as a building material.

Although State's Attorney John E. W. Wayman was unable on account of sickness, to personally address the meeting, he sent an able representative in Mr. Northrop, Assistant State's Attorney. As Mr. Northrop expressed it, the day has come when we will be rocked in a cradle of cement; live in a cement house, and finally be buried in a cement casket.

The general feeling of the evening was one of informality with plenty of good songs and apt stories to make the members forget there was such a thing as trouble.

MORNING SESSION, FEBRUARY 23.

The third day's work of the convention found the members in good working order, and well settled down because well acquainted with one another, and in good spirits after the diversion of the Washington Birthday smoker and vaudeville entertainment. In fact, the introduction of the social feature is a pronounced success.

After the committee had labored the allotted time in the preliminary meeting over the specifications for cement products, W. P. Anderson, chairman, presented the report at the regular morning session. The standard specifications for concrete blocks as adopted at previous conventions was found in the discussions of the proposed amendments to be pretty well grounded, and quite difficult to improve upon any broadly applicable basis. The matter of specifications for concrete drain tile was found to be difficult, because as yet not well enough known to properly standardize. The discussion continued until it was necessary to pass the matter over to another time.

In the business session the several amendments to the by-laws of the association were adopted as recommended by the executive board. All of these amendments have been developed by experience and were so clearly for the good of the organization.

AMENDMENTS.

Amendments to the by-laws of the National Association of Cement Users were made at Wednesday morning's session, as follows:

Amend Article I by striking out Section 5 and inserting a new Section 5 to read as follows:

Section 5. Resignations from membership must be presented in writing to the secretary within thirty days after the close of the fiscal year and shall be acceptable provided the dues are paid for that year.

Strike out Article II and insert a new Article II, as follows:

Section 1. The officers shall be the president, the vice-presidents, the secretary and the treasurer, who, together with the five latest living past-presidents, shall constitute the executive board. Vacancies occurring during the year shall be filled by the executive board.

Sec. 2. The elective members of the executive board consisting of the president, the first, the second, the third and the fourth vice-presidents, shall be elected annually by ballot at the convention at a business session fixed by the executive board and shall hold office until their successors shall qualify.

Sec. 3. The elective members of the executive board shall appoint the secretary and the treasurer; they shall create such special committees as may be deemed desirable for the purpose of preparing recommended standards concerning the proper use of cement for consideration by the association, and shall appoint a chairman for each committee who shall be a vice-president of the association. Four additional members on each special committee shall be appointed by the president, in consultation with the chairman.

Sec. 4. It shall be the duty of the executive board to audit the accounts of the secretary and the treasurer before each annual convention.

Sec. 5. The executive board shall appoint a committee on nomination of officers and a committee on resolutions, to be announced by the president at the first regular session of the annual convention.

Sec. 6. There shall be an executive committee of the executive board consisting of the president, the secretary, the treasurer and two of its members, appointed by the executive board.

Sec. 7. The executive committee shall manage the affairs of the association during the interim between the meetings of the executive board.

Sec. 8. The president shall have general supervision of the affairs of the association. He shall preside at the annual convention, at the meetings of the executive board and the executive committee, and shall be ex-officio member of all committees.

The vice-presidents in order of seniority shall discharge the duties of the president in his absence.

Sec. 9. The secretary shall perform such duties and furnish bond as may be determined by the executive board.

Sec. 10. The treasurer shall be the custodian of the funds of the association and shall disburse the same in the manner prescribed by the executive board. He shall furnish bond in such sum as the executive board may determine.

Sec. 11. The secretary and the treasurer shall receive such salaries as may be fixed by the executive board.

Amend Article III to read, as follows:

Section 1. The association shall meet annually. The time and place shall be fixed by the executive board and notice of this action shall be mailed to all members at least thirty days previous to the date of the convention.

Sec. 2. The executive board shall meet during the convention at which it was elected, effect organization and transact such business as may be necessary.

Sec. 3. The executive board shall meet at least twice each year. The time and place to be fixed by the executive committee.

Amend Article IV to read, as follows:

Section 1. The fiscal year shall commence on the first of July and all dues shall be payable in advance.

Sec. 2. The annual dues of each member shall be \$5.

Sec. 3. A member whose dues remain unpaid for a period of one year shall forfeit the privilege of membership and shall be officially notified to this effect by the secretary, and if these dues are not paid within thirty days thereafter his name shall be stricken from the list of members. Members may be reinstated upon the payment of all charges upon the books of the association.

Amend Article VI to read, as follows:

Section 1. Amendments to these by-laws, signed by at least three members, must be presented in writing to the executive board prior to November 1 and shall be printed in the notice of the annual convention. These amendments may be discussed and amended at the annual convention and passed to letter ballot by a two-thirds vote of those present. Two-thirds of the votes cast by letter ballot shall be necessary for their adoption.

ELECTION OF OFFICERS.

The following officers were elected for the ensuing year:

President, Richard L. Humphrey, Philadelphia, Pa.

First vice-president, Edw. D. Boyer, Catasauqua, Pa.



PETER GILLESPIE, TORONTO, ONT., PRESIDENT
CANADIAN CEMENT USERS' ASSOCIATION.

Second vice-president, M. S. Daniels, New York.

Third vice-president, Edw. S. Larned, Boston, Mass.

Fourth vice-president, F. A. Norris, Boston, Mass.

A vote of thanks was extended to the retiring vice-presidents, Merrill Watson of New York, who will be in Europe for at least the greater part of the year, and to Geo. C. Walters of Atlanta, who requested to be retired.

EVENING SESSION, FEBRUARY 23.

Dr. Joseph A. Holmes, who had engaged to give a lecture on the technologic work of the United States Geological Survey, was unable to be present.

President Humphrey, who is equal to every occasion within himself, supplied the number of the program with one of the most entertaining features of the meeting. He had a number of lantern slides to illustrate his observations of concrete work as produced by European workmen. The list included bridges with ornamental treatment and both the exterior and interior of practically every type of building. The running comment and explanation was instructive in the highest degree, and shows that there is still a whole lot of work for the association to accomplish.

Professor Peter Gillespie, of Toronto, read an immensely interesting paper on reinforced concrete columns. He used a number of lantern illustrations and proved himself master of his subject.

At the close he was roundly applauded. The paper was extensively discussed by Professor Talbot of Illinois University, E. S. Larned, H. C. Turner and many other members of the association.

This was followed by another paper bearing generally upon the same subject by Robert A. Cummings, of Pittsburgh. He also had several illustrations of the lateral system of reinforcing concrete columns.

PROPOSED METHODS FOR THE REINFORCEMENT OF CONCRETE COMPRESSION MEMBERS.

By Robert A. Cummings, M. A., Sec. C. E., Pittsburgh, Pa.

It is not difficult in these days to understand how the successful use of plain concrete en masse has been followed by the development of its structural properties in articulated structures. In the early stages of the industry there was a vague idea that the mere embedment of metal was of advantage. The writer remembers over thirty years ago watching granite sidewalks being laid, in which plain square iron rods were embedded below the surface of the sidewalk and near the edges of the block. In reply to his query, "Why were the rods embedded?" it was said, "To be good for the concrete." By the vast majority of practical workers much the same general answer would be given today. Indeed, it may be said that the progress in reinforced concrete has been subordinated to commercial promotion of the steel reinforcement.

Since 1893, when the writer became actively interested in reinforced concrete, the study of its structural properties has engaged his attention. Previous use of concrete en masse having been confined to resisting compressive stresses, it was natural that his efforts should have been directed to increasing the unit value in compression. Little information of a scientific nature was available at that time, but the studies of the practical conditions and theoretical requirements resulted in his application for patents for hooped concrete about ten years ago. This application embodied the individual hoops characteristic of his present methods and brought to light a number of anticipations applied to concrete blocks—some of them patented in Great Britain fifty years before. Yet hooped concrete was not applied to columns and struts in the United States prior to the work of the writer.

Since 1893, when the writer became actively interested in reinforced concrete, his attention was directed to improving the details of the steel reinforcement and the methods of holding the same in position. These may be briefly referred to in the proper development. The first requirement was the order horizontal spacing of the hoops and their complete embedment in the concrete, which was rich mixture having aggregates not exceeding one inch diameter. In order that the concrete might flow between the hoops, minimum spacing was controlled by the size of the aggregate and did not exceed one and one-half inch in any size column. The hoops were held horizontally in position by weaving vertical wires alternately between them. The columns of the Galilee Mills, Richmond, Va., were constructed in this manner and have been subjected to a load of a thousand pounds per inch for the past seven years without the slightest evidence of distress. Later a metallic spacing strip with projecting fingers to mechanically engage each hoop has been employed. At first some difficulty was encountered in securing a satisfactory joint for each hoop. A method of interlocking the ends and later of riveting them was adopted, one end being bent outwardly to contact with the mould and hold the cage-like reinforcement concentrically with the column. Subsequently an independent device with an outwardly projecting finger clamped to the hoop and vertical column rod was used to serve the double purpose of holding the hoop concentric with the axis of the column and the vertical rods in their proper position. A rational development of hooped concrete to meet practical and theoretical conditions was thus developed.

But certain difficulties have been encountered in its application to incline compression members. For instance, in ribbed concrete arches and diagonal struts, the depth of the rib is greater than its width, so that circular hooping is not readily adapted. This paper, therefore, will serve to bring the study of reinforced concrete in compression to your attention by referring to a proposed method of reinforcement applicable to compression members built in a horizontal or inclined position.

Argument.

When a solid is acted upon by a compressive force, there is set up internal stresses that tend to disrupt its structure. These forces may be termed cohesion and friction. Cohesion is the force by which the molecules hold together. Friction is resistance of the molecules to motion. Sand may be considered as a cohesionless body, while its resistance to compression is due to friction only. If a tube is filled with sand to a limited height and subjected to pressure, there is a tendency for the tube to bulge outward, which is resisted by the metal shell. When the tube is filled with concrete and subjected to pressure, the resistance is increased by molecular cohesion and less lateral pressure is exerted on the tube. Assuming that the coefficients of friction be the same, the difference between the resistance of the sand and the concrete is the effect due to cohesion.

If a prism of concrete is placed in a compression machine and subjected to a compressive force, it is the universal custom to treat the prism as having failed in direct compression and that its strength is equal to the sectional area divided by the load. This theory has led up to a general misinterpretation of internal stresses in compression tests. The characteristic pyramidal shaped failures of cubes in compression is due to the friction between the plates of the testing machine and the specimen by preventing lateral misplacement of the molecules. The introduction of a greased surface has reduced the friction sufficiently to show that failure takes place along the lines parallel to the direction of the pressure after the elastic limit of the material has been exceeded. In consideration of this fact, experimental studies have been made by placing reinforcement at right angles to the direction of pressure and at variable distances apart. The result of the experiments on metal sheets has conclusively shown that the strength of concrete can be greatly increased. It has also shown that the results are due to the close spacing of the layers of reinforcement and further verifies the well known increased compressive resistance of mortar in the joints of masonry.

ROCK PRODUCTS

The tests referred to also indicate that the best percentage of reinforcement is capable of being determined within reasonable limits or that which produces the greatest result with the least amount of steel.

In almost all construction in reinforced concrete practical methods largely govern the distribution of steel. This is particularly true in column work where the concrete is placed vertically so that the use of wire netting or sheet metal in horizontal layers is out of the question. Hooping remains the only practical method of safely increasing the unit compressive strength of concrete for such work.

But in inclined compression members where the concrete is deposited on one side of the member, the difficulty of using lateral reinforcement is reduced and some time ago the writer suggested the use of concentric and interlocking hoops combined with longitudinal reinforcement for resisting shear in arch ribs. This has been followed by some of his experiments on the effect of lateral reinforcement using different weights and disposition of the steel. These tests were not carried out with the degree of refinement and accuracy desired, hence simply indicate what one might look for in further studies.

An examination of the curve plotted from the ultimate load and percentage of reinforcement indicates strength value directly proportional to the amount of reinforcement. Also that the best disposition of the steel is that which intersects the resultant of the meridional forces and the lateral deformations.

It has not been thought advisable to discuss the relative merits of added cement to the concrete instead of reinforcement, as it is complicated by the excessive internal stresses due to the shrinkage of rich mixtures which tend to result in cracks, besides the question is largely a simple arithmetical problem.

The writer has applied the proposed method of lateral reinforcement in his practice with very encouraging results, particularly in concrete piles cast horizontally on the ground.

The extraordinary severe treatment to the head when the hammer strikes a concrete pile is not duplicated in any other class of work. In a case where the reinforcement was distributed in wire spiral planes spaced two inches apart in the head of the pile, a test was made on a pile about thirty days old. A hammer, weight sixty-five pounds, was used, falling from four to seven feet. This pile was driven through very sandy gravel into a bed of fine sand during a period of three and a half hours. About nine hundred blows were struck on the head of the pile with no deterioration to the concrete. This work opens up a broad field of usefulness for the proposed method of reinforcement.

The closing number of the evening was the paper by Sanford E. Thompson, Newton Highlands, Mass., on the subject of "Longitudinal Reinforcement in Concrete Columns." President Humphrey read the paper in Mr. Thompson's absence, which was unavoidable.

MORNING SESSION, FEBRUARY 24.

The fourth day's session of the association was well attended and the interest was just as great as that of the earlier sessions. Early in the day a meeting of the section of building laws and insurance as well as a meeting of the section on specifications for fireproofing was held.

The meeting was called to order by President Humphrey at 10:30 a. m. W. H. Ham, chairman of the committee on building laws and insurance, read the report of that committee. This was divided into two sections; (a) is the proposed standard building regulations for reinforced concrete; (b) report on insurance. The former was adopted and this will be referred to the association to be voted upon by letter ballot. The report on insurance was accepted by the convention.

R. P. Miller, chairman of the committee on specifications for fireproofing, read the report of that committee.

REPORT OF COMMITTEE ON SPECIFICATIONS FOR FIREPROOFING.

Rudolph P. Miller, Chairman.

The proper amount of fireproofing material required to safely protect the structural members of buildings against the destructive effect of fire is a question on which opinions, for it is at the present time only a matter of opinion, vary according to the viewpoint. In the protection of the lower flanges of the beams in fireproof floor constructions, for instance, some architect's specifications and building ordinances call for a full two inches of protection, while on the other hand, it has been seriously argued by builders of good repute, that no protection is required for the soffits of the beams, provided the beams are thoroughly encased on the sides with fireproof materials. Between these extremes there are as many opinions as there are advocates for different materials and systems of construction.

The construction of fireproof floors has received considerable attention from investigators. The Bureau of Buildings of New York City has conducted more than fifty-five tests on full-sized floor constructions, the British Fire Prevention Committee has made fully twenty such tests, the Underwriters Laboratories in Chicago have also done work along this line, and here and there isolated tests have been made by individuals and corporations. And yet with all these results at hand, no definite conclusions have been drawn or standard specifications formulated which can be said to have received general acceptance.

Curiously enough, the protection of the most important element in the superstructure of a building, the column, has had least attention paid to it. Practically no tests have been made on the fireproofing of columns, and the requirements for the form of protection are almost entirely a matter of opinion.

In view of these conditions, it was felt by the Committee on Specifications for Fireproofing that its first step toward definite conclusions and satisfactory and acceptable standards would be to gather full and reliable information about the materials used for fireproofing

and their effectiveness as shown by prearranged tests or by actual fires. It can be readily seen that this plan involves much labor and will require time, and it is for this reason that your committee, composed of men whose occupations keep them busily employed, have not been able to submit to you at this time any definite conclusions. The collection of data has been well underway, but is by no means sufficient along one line to yield results.

The main work of the committee, for the present at least, will be to study the question of proper protection for the structural elements of buildings, such as beams, girders, columns, lintels, etc., whether the same are of steel, concrete or any other material. The committee will also gather all information it can, bearing on the proper materials and construction of floor arches, partitions, walls, etc., for future study.

The committee also feels that its work would not be complete, and not even impartial, if it limited its investigations to cement products, and for that reason is desirous of obtaining data on other materials used for protective purposes.

It can be readily seen that acceptable conclusions must of necessity be based on many considerations, among which the following may be mentioned: Should the proper protection be capable of safely resisting only the ordinary conditions of a fire, or should it provide for the extraordinary conditions as well? What may be accepted as the ordinary conditions of a fire, what temperatures and for what length of time? Can fireproofing be properly graded to suit varying degrees of hazard? What effect, if any, does the composition of the materials have on the efficiency of the proposition; is, for instance, any one mixture or proportion of concrete superior to another, or is one kind of clay for terra cotta better suited than another? The thickness and method of application of the protective material must of course play very important parts in this investigation.

For the purpose of securing all possible information that can throw any light on the behavior of different materials subjected to fire, a schedule of questions has been prepared and is given at the end of this report. This schedule will indicate along what lines the committee intends to work, and will serve as a guide to all who can and will assist the committee. Any information, even if only partially answering the questions will be appreciated. The results of fire tests, as well as the effects of actual fires, are desired. In all cases the trustworthiness of the information should be shown. No fear need be felt of the possibility of duplicating information, as the committee would rather submit to the trouble of eliminating than risk the loss of valuable facts. Besides, the same phenomena often impress different observers in different ways, and any subject is best considered when all sides have been impartially heard.

It is fully realized that the complete information as outlined in the schedule can probably not be furnished in many cases, but this should not deter any one from giving so much of the information as can be obtained. Any one desiring a copy of this schedule can secure the same by applying to Rudolph P. Miller, City Engineer, New York City.

Angus B. MacMillan then read a paper on the "Simple method for computing the strength of flat reinforced concrete plates." This was illustrated by stereopticon views on this system and the lecture was well delivered.

Emile G. Perrot, of Philadelphia, gave an illustrated lecture on "Long span light floor reinforced concrete construction with cost data." Mr. Perrot is one of the firm of Perrot & Ballinger and enthusiastic concrete architects.

Charles D. Watson, C. E., Syracuse, N. Y., read a paper on "Cost data on reinforced concrete floor construction with separately molded members." Mr. Watson advanced the argument that it is cheaper to mold members at the plant and transport them to the job for which they are required than to use forms in the wall. He said that the work of erection could be carried on the same as steel construction and could be set by the same method.

EVENING SESSION, FEBRUARY 24.

J. H. Libberton, who has made considerable investigations on concrete drain tile, gave a stereopticon lecture on "Cost and advantages of concrete drain tile." Mr. Libberton's talk was very comprehensive and showed how thoroughly he was posted on this subject. His findings are the result of many weeks' work among the manufacturers of this product. The lecture was followed by the reading of specifications for drain tile and the discussion waxed warm. The committee wanted to rule that nothing but slush concrete sewer pipe could be made out of doors. All other concrete tile should be made inside the buildings.

President Humphrey made a strong talk which was roundly applauded. He said that he objected to the distinction of hand tamped and poured concrete tile. The report of the committee by vote of the convention was referred back to the committee to be revised and reported at the next convention.

Amendments were made to the specifications in curb, gutter and concrete pavements which were accepted by the convention and will be submitted to the association for letter vote.

The paper by Ernest B. McCready, general manager of the Lehigh Valley Testing Laboratory, Allentown, Pa., on the "Essentials in cement hollow wall block construction" was read by President Humphrey.

F. S. Phipps, of St. Joseph, Mo., gave an illustrated talk on the "Installation and operation of a steam curing plant." Mr. Phipps showed views of the plant

of which he is manager and as he has been very successful in working out steam curing problems is well fitted to talk on this subject.

Following this a lengthy discussion followed on curing by steam and other methods.

The paper, "Comparative cost and efficiency of the reinforced concrete gravity dams," by William L. Church and Howard L. Coburn, was read by title.

The meeting adjourned at 11:30 p. m.

At the time of going to press the association is still in session, and a report for the last day's meeting will be reported next month, as well as a number of papers which have been necessarily omitted on account of lack of space.

Has a Busy Week.

Harry S. Doyle, reinforcing expert of the American Steel and Wire Co., Chicago, enjoys the distinction of being the only man in the great cement show who can cover every engagement with credit to his high reputation. His list includes the Cement Show, the National Builders' Supply Association, National Cement Users' Association, Society of Municipal Engineers, American Society of Engineering Contractors, and the Northwestern Concrete Association. None of them can do without him.

Booming N. C. U. Membership.

The following invitation was issued Thursday:

The exhibitors and as many of their assistants as possible are invited to meet Richard L. Humphrey, president of the National Association of Cement Users, and the members of the Executive Board, at 6 p. m., today, February 24th, at the monument on the center aisle.



HARRY S. DOYLE, REINFORCEMENT EXPERT,
AMERICAN STEEL & WIRE CO., CHICAGO.

About 6 o'clock some one got out the big stick and made a large noise on a metal gong. The enthusiastic crowd gathered around the base of the monument where Mr. Humphrey and his staff had established a temporary office, and this impromptu meeting was called to order by B. F. Affleck, chairman of the Cement Products Exhibition Company. Mr. Affleck explained briefly that the object of the meeting was to arouse more interest in the association, which has done more good for the industry than any similar organization. Richard L. Humphrey, president of the association, was then introduced to the assembly. Mr. Humphrey's talk was one of the most sincere appeals for the general cooperation of the manufacturers, the dealers and the users of cement and its products, ever delivered at an impromptu meeting. He went into the history of the association, cited a few of the many instances where members have received direct benefit, and ended by an urgent appeal for more members.

President Humphrey's talk was greeted with great enthusiasm and while Vice-President Larned was making the final talk the work of enrolling new members went merrily on. Mr. Larned's speech was of similar nature as the president's and was a clincher. A great many new members were enrolled.

Chicago Cement Show a Success.

Exhibits Unusually Large in Number and Attractive in Character—Attendance Overcrowds the Big Coliseum—Many Features of Interest—The Personal Equation.

The third annual Cement Show, held under the auspices of the Cement Products Exhibition Company, beginning February 18 and continuing through until the 26th at the Coliseum in Chicago, marked another epoch in the onward march of cement and its products.

This show has become the one great annual event in the concrete industry and is looked forward to with keen interest by the manufacturers of cement and machinery and the users of concrete throughout the United States and Canada. As an educational feature it has done more good than any other one thing to disseminate the false impressions which have existed in the past, and to show by actual demonstration the tremendous strides which have been made in this field.

The officers having the show in charge are to be congratulated upon the successful outcome of the exhibition. Not a single incident occurred to mar the entire event. One thing was shown clearly, and that is the Coliseum is no longer able to accommodate the vast number of exhibitors who annually clamor for admittance. There will either have to be some process of elimination evolved or a larger exhibition hall provided. If, as in the past, anyone who has the price of a booth will be allowed the privilege of making an exhibit, it is safe to predict that in a few years a hall double the size of the Coliseum will have to be built to hold them all.

The "Old Guard" of the industry were on hand in numbers, but many new faces were seen for the first time among the exhibitors. Several new propositions were advanced which indicate clearly the progress of the industry. The exhibitions were on a more elaborate scale than ever.

Taking it as a whole the show was a gigantic success, arousing widespread interest from ocean to ocean and from lakes to gulf. The attendance was by far the largest ever recorded. The amount of interest shown indicates that the public at large are aroused.

The decorative features were a harmonious blending of color effects, and from an artistic standpoint far surpassed those of any previous year.

The immense monumental centerpiece was a happy thought on the part of the management and attracted widespread interest.

Throughout the entire show Bredfield's Chicago concert band under the direction of H. C. Bredfield gave an elaborate program, interspersed with vocal selections for the enlivening of the occasion.

A feature of the show was the daily lectures with stereopticon accompaniment given under the direction of Percy H. Wilson, the able secretary of the National Association of American Portland Cement Manufacturers.

The consensus of opinions among the exhibitors was that the crowd was a buying one and many sales were recorded. The show will go down into history as the greatest exposition of cement and its allied interests that has ever occurred in any part of the world.

MONUMENT TO CEMENT INDUSTRY.

The monument to the cement industry, which occupies the center of the floor, is in itself a great feat of decorative construction. This monument was designed by Louis Ghilini, a well known Chicago sculptor, and erected by the Decorators' Supply Company, under the supervision of F. F. Nichols. The entire monument, base and figure, stands 48 feet in height, the figure alone being 16 feet high, was cast in sections and put together like the working out of a huge block puzzle in less than four days' time. The design of this piece of art is intended to tell the story of the development of the cement industry and its branches along the lines of beauty, strength and durability; to leave a clear impression in the brain of the observer of the magnitude it has reached,—the great possibilities of advancement yet to be made and to clearly impress upon you that we are gradually leaving the iron age of construction and have taken a great stride into the practically new, cement age.



EDWARD M. HAGAR, PRESIDENT CEMENT PRODUCTS EXHIBITION CO.

The Miracle Pressed Stone Company, of Minneapolis, have installed a very pretty exhibit to the left of the central figure at which their force of sales artists are keeping open house. Don't fail to call at this exhibit if you want to see something interesting.

George W. de Smet is again smiling at the visitors from booth 44, where he has erected very beautiful exhibit. The combination of the various materials handled by Mr. de Smet is worked up into an artistic effect, which is impossible to be produced with any one article. Mr. de Smet is assisted with his demonstrations by F. Miller, Jr., L. Briggins, H. L. Fisher and C. C. Green.

Charles S. Girvan of Girvan-Noehod Company, 1220 Locust street, Philadelphia, Pa., selling agents for Aquabar, the waterproof compound, with a guarantee back of it, is making his headquarters at Booth No. 12, where the Wisconsin Lime & Cement Company are in charge, with a large force of attentive salesmen. Charles Dynes, whom everyone knows and esteems, is in charge of this booth.



J. U. C. McDANIEL, SECRETARY-TREASURER CEMENT PRODUCTS EXHIBITION CO.

W. A. Barrows and Wilcox Doolittle are representing the Kelly Island Lime & Transport Co., Cleveland. They have something of interest to every cement user. This is the use of hydrated lime for concrete mixtures and the famous White Rock brand of lump lime. Frank Holland, the well known eastern representative of this company, will be on the job the early part of next week.

The T. L. Smith Co., 301 Old Colony building, Chicago, is making a fine display of their mixers at booths 58-59. A. L. Tucker is in charge, assisted by L. Hudson and G. E. Hillsman. This exhibit consists of one No. 10 Smith mixer, 1910 model, with side loader and automatic tank, and one Smith hand mixer. Mr. Tucker will take pleasure in explaining the merits of these machines.

The Hildreth Manufacturing Company, Lansing, Mich., have an exhibit at booth 302. The Noro line of gas engines adapted to cement machinery are becoming more popular every day. Their merits are many. Hoisting outfits for contractors and builders are also on display. Noro spray rigs and grey iron castings for gasoline engines are manufactured by them exclusively. You will be most cordially welcomed at booth 302.

The Marblehead Lime Co., of Chicago, are to be found at booth D-6. This is a very interesting exhibit and consists of a number of samples of concrete construction with admixtures of high calcium hydrated lime, demonstrating its waterproofing qualities. Series of tests by Robert W. Hunt & Co. show the strength of Crown Hydrate in concrete mixtures. The obliging young men in charge are: J. B. Graham, D. H. Howe and C. E. Marvin.

The Cement Tile Machinery Co., of Waterloo, Ia., is entertaining and educating the happy throng of sightseers from booths 362-3, where they have installed the Schenk cement drain tile machine, the Perfection mixer and the Ideal car. Their offices are located at booth 256. The good fellows demonstrating these machines answer to these names: J. H. Stewart, W. H. Stewart, J. M. Schenk and Godfrey Gross, F. M. Kennedy, E. A. Stewart, S. L. Morton, W. L. Northrup, T. G. Spellman and E. E. Schenk.

G. W. Swiney is assisting C. F. Dynes, of the Wisconsin Lime & Cement Co., at booth 12. Mr. Hinton, of the same company, is also one of Dynes' able corps. Aquabar and Beaver Board will be made well known before the show is over. Ask them about Beaver crete. All cement users will be interested. By the way, all builders' supply men should secure one of their catalogues. Almost everything that is exhibited at the show in this line will be found in it.

The Century Cement Machine Company, of Rochester, N. Y., is exhibiting at booth 36 under the fatherly care of A. T. Bradley, assisted by J. W. Cherveneau and E. J. Thompson. This exhibit of the Hercules concrete block machine and their products includes a photographic exhibit of the Hercules Prize Contest, showing some of the buildings erected with stone made on machines.

The Hercules machine has an established place in the trade and Mr. Bradley reports a good business and a bright future for 1910.

The American Pulverizer Company, of St. Louis, Mo., have on exhibition in Booth 212 one of their rock pulverizers known as No. 30. The display is in charge of George C. Vidotto, secretary, and William H. Hess, the Chicago representative. The exhibit is interesting to those engaged in crushing rock.

Fred G. Langner, president of the Langner Manufacturing Company, of Cleveland, visited Rock Products' booth. Mr. Langner's company manufactures iron specialties and machinery. He has just a little bit the smoothest brick clamp that has come to our notice and anyone interested in the economical handling of brick will certainly miss something if they don't see Mr. Langner and his Cleveland Brick Clamp.

Besides the Peerless brick machine L. V. Thayer, of the Peerless Brick Machine Company, is showing for the first time Peerless colors. The mantel of fancy brick is so attractive that one feels like drawing up a chair to warm up these cold days.

The H. B. Sackett Screen & Chute Company, Chicago, extend a cordial invitation to all to call at their booth, No. 327. Their display of cars for handling concrete, contractors' buckets, portable track, turntables, steel chutes, etc., is intensely interesting.

The Kent Machine Company, of Kent, Ohio, is to be found at booths 135-6-7. Here is exhibited the Kent Precision mixer with traction in the various sizes. F. A. Kershaw has charge and he has assisting him F. H. Merrell, E. N. Barber and A. L. Post.

Over in the Annex you will find at booth 215-216 the Sioux City Cement Machinery Co. They have the McCracken concrete tile machine to talk about. Ten thousand concrete tile is really going some and worth talking about. This machine is also equipped to make from 3,000 to 5,000 concrete blocks per day, so it is worth looking at, anyway. W. J. McCracken, a practical concrete man, inventor of the machine, is in charge. He is assisted by F. J. McCracken, H. E. Johnson, H. Loucks, B. J. Dodge, Pearl Hoffman, A. B. Elliott, A. Hillman and J. Wayne.

The Chicago Portland Cement Co. has an exhibit to the left of the central figure that is one of the most beautiful of its kind at the show. It is composed of a balustrade surmounted by illuminated post caps displaying the "A" Chicago Portland Cement trademark, and the general plan of the booth is of the garden effect, latticed background, seats and settees. W. F. Main is in charge of this exhibit, assisted by W. B. Tracey, M. R. Lilly, C. H. Greenleaf and B. Koepke, who are explaining the various uses and the practical value of "AA" brand of cement.

The American Steel & Wire Company show triangle mesh reinforcement as the most attractive material for the practical concrete worker. Harry S. Doyle, chief of concrete reinforcing, is in the charge of course, and as usual is prepared to meet every visitor with a different personality. He is the only man in the business who can count for two in less than a minute, and it's all done with the whiskers. The exhibit this year exceeds anything ever shown in the reinforcing line for instructing the prospective purchaser and user.

N. P. Annis, Ed Berrott and G. A. Hancock, of the Centrifugal Concrete Machine Company, Chicago, greeted many friends at their booth in the balcony, 270. This company has one of its machines on exhibition and also a miniature machine. Mr. Annis said they would make blocks on this model machine throughout the show to show the principle on which it works. Mr. Annis showed the representative of ROCK PRODUCTS one of the blocks made of concrete of a 1-4 mixture that had been standing in a pan of water ten months and it was not wet up to the core as yet. The block had only been made forty-eight hours when it was placed in the water. The operation of this machine will be one of the interesting features of the show.

A. A. Pauly, the inventor of fireproofing and structural concrete tile, is on hand with an able corps of assistants. Grouped around his central exhibit are the booths of a number of the allied companies that manufacture concrete tile by the Pauly system. Besides the Concrete Stone & Sand Company, the original plant, there is tile on exhibition from the factories at New York, Meadville, Pa., Waterloo, Iowa, San Francisco and other places. In fact the whole exhibit is constructed of tile. One feature is a floor section of tile and beam construction which will have the wooden forms stripped today—24 hours after placing the concrete. Martin Fleming, practical tile expert, is chief of Mr. Pauly's staff. W. S. Tait, of the Chicago Structural Tile Company, is representing that branch of the business.

Fred Paulson, traffic manager Indianapolis office of the Lehigh Portland Cement Company, hardly had time to talk, he was so busy greeting his many friends. Anyone who knows Fred will sympathize with him and appreciate his suffering, for when it is impossible for him to talk he certainly is in a bad way. This is the penalty of being popular. B. L. Swett, of the sales department, is ably assisting Mr. Paulson.

Louis H. Sturtevant, president of the Sturtevant Mill Company, Boston, Mass., assisted by H. A. Tomlinson and W. T. Doyle, has opened up his exhibit in booths 128 and 129, southeast corner, for the inspection of the critical public. The Sturtevant Mill Company's exhibition is composed of their No. 2 ring-roll pulverizer for preliminary and finishing grinding of cement clinker, limestone, coal, etc., and a No. 3 Newago separator for screening all materials used in the manufacture of cement. This is the famous "TWANG" equipment and screens everything perfectly from 20 to 200 mesh.

The feature of the Simpson cement mold is that highly artistic cement work can be done without the expense of costly expert labor and without the services of an artist. The Simpson Cement Mold Company, Columbus, O., has booths 165 and 166. The exhibit is in charge of Harold G. Simpson, assisted by B. L. Simpson, E. A. Bending, A. W. Simpson and Albert Ross. The company is showing molds for ornamental blocks, porch columns, newels, caps and bases, finials, balusters, rails, fronts, foundations, bridge balusters, pergola columns, lawn vases, lawn fences, flower urns, window sills, chimney blocks and other concrete specialties, as well as a complete display of the work done by the molds.



J. P. BECK, GENERAL MANAGER CEMENT PRODUCTS EXHIBITION CO.

The National Water-Proof Company, 614 Harvester building, Chicago, have an exhibit that is most attractive. Their booth number is fourteen. James Mackie is in charge, assisted by Max Rhodes, Theo. Thomas, W. D. F. Mackintosh and J. J. Fitzgerald. "Te-Pe-Co," the no-oil mineral liquid waterproofing compound for concrete and all classes of masonry, exterior and interior, is here shown, together with practical demonstrations illustrating the various uses, methods of application, efficiency, etc.

The Taylor Iron & Steel Co., High Bridge, N. J., located at Booth 94 in the northwest end of the building, are exhibiting their "Tisco" manganese steel castings which are used in the manufacture of cement. The chief characteristics of Tisco castings are their ability to resist wear and breakage, thereby increasing the efficiency of plant equipment and reducing repair expense to a minimum. The exhibit embraces such parts as gears, ball mill plates, Panama teeth, sprockets, chain and various other wearing parts of machinery. This exhibit is in charge of J. M. Sherrard, R. D. Van Valkenburg, W. Ross Glasgow and H. A. Johann.

The German-American Portland Cement Works are to be found at booth 141. Sales Manager E. L. Cox is on the job, assisted by his lieutenants, J. J. Dugan, G. E. White and Joseph Schall. They are as wise as "owls" when it comes to boosting their cement.

Wadsworth, Howland & Co., Boston, Mass., has booth 274 and is represented by Arthur Felton, assisted by Leslie L. Turner. Mr. Felton says they have as complete an exhibit of the "original" Bay State brick and cement coating as is possible to show in Chicago.

In the second story of the annex, the Universal Portland Cement Company has a miniature farm laid out showing how cement can be adapted to farm houses, barns, silos, etc. This will be of special interest to visitors, as this end of the cement business is becoming more important each year.

Sid L. Wiltse, with his Systematic mixer, is sustaining the reputation of the Cement Machinery Company, of Jaxon, Mich. He has worked out this machine himself, and his long experience in concrete machinery and wide acquaintance with the trade puts him and his machine in the front rank.

The Milwaukee mixer, with a gold drum and perfectly balanced in the most approved style of mixer experience, has already attracted the attention of those who know the requirements. W. J. Roseberry, with a corps of assistants, is showing the machine in constant operation in the Annex.

Don't fail to see how the materials are tested at the miniature laboratory of R. W. Hunt & Co., the well known cement testing experts, on the main aisle. It will be well worth your time to see the different tests that the various materials must stand before they are sold to you.

R. C. Vidal, of the Blanc Stainless Cement Company, New York, was one of the early birds. He says the white Portland cement business is growing very rapidly. Since the last cement show Mr. Vidal has become a Benedict, which accounts for his unusually happy smile and well satisfied appearance.

Milton J. Williams is never happy unless he is running some kind of a motor. As he can't run his car these days he has to content himself with running an electric motor to operate the Williams pulverizer. As the wheels click merrily on a broad smile of satisfaction spreads over Mr. Williams' face.

One of the most beautiful and interesting exhibits to be found at the Coliseum is that of the Marquette Cement Manufacturing Company, booths 64-65. Gold Williams is in charge, and without listening to his interesting talk you have attended the Cement Show in vain. You will find it hard to leave Mr. Williams.

C. C. Quiney, S. F. Bartlett, H. J. Schmoeger, R. E. Baughan and S. H. Beard represent the United States Gypsum Company, in booth 57. The company has a fine exhibit, showing fireproof gypsum products, gypsum studding, Sackett plaster board, United States Gypsum hollow tile and fireproof wall plaster.

There is a very genial gentleman—one E. A. Foster—in charge of booth 333. This is the headquarters of Samuel Cabot, Incorporated. Mr. Foster will take pleasure in exhibiting Cabot's waterproof cement stains, showing the material and its application upon various cement surfaces both for waterproofing and coloring.

A Troy bottom-dump wagon, a Troy reversible dump wagon for engine hauling, a Troy dump box for use on common wagon gear and a Troy teaming gear comprise the exhibit of the Troy Wagon Works Company, Troy, O., at booth 71 and 72. The company is represented by O. G. Mandt, L. R. Craig, N. L. Phillips, M. F. Eichmann and C. A. Geiger.

The First Concrete Memorial.

Cement was first applied to memorial work in a very peculiar manner by a goat, according to a story, which runs something like this:

Bill was passing a building which was in the course of construction and came to the place where the cement was being mixed.

He probably had never seen any cement before, at least never had eaten any, so he tasted it. Evidently the novelty of the thing appealed to Bill because he proceeded to fill up on it. By the time William reached home the cement was setting good and hard and within a few hours he died. His owners, noticing the hardness of his stomach and not knowing the circumstances, held an autopsy on Willie only to find a beautiful model of William's vital organs. They buried him and placed this mold over his grave as a marker with this inscription on it:

"This is a perfect likeness of William, molded by himself, interior view."

Side Talk

The general agitation for good roads all over the country has resulted in a new and profitable opening for concrete workers. A thorough investigation of the comparative cost and durability of the various kinds of culvert material has convinced those in charge of the roads that concrete culverts are not only among the cheapest, but that they are the only really permanent culverts. They can be made for much less than corrugated iron or clay pipe are better looking and are practically indestructible.



A CONCRETE CULVERT MADE WITH MERILLAT'S CULVERT CORE.

There are on the market a number of steel forms for making concrete culverts. These forms or cores are made to collapse after the concrete has set and because of their durability and convenience are incomparably better than wooden forms. But the objection to these collapsible steel forms has always been that a different form was required for each different size of culvert, and though the forms were sold at a reasonable price the amount of money required to secure even a small number of sizes was in most cases prohibitive.

If one form could be adjusted to different sizes the culvert question would be solved; and that is just what has been done. The Merillat Culvert Core Company, of Winfield, Iowa, are making and selling at a very reasonable price a culvert form that is automatically adjustable to any and every size between 20" and 48". By merely turning a hand-wheel at one end of the machine the core may be expanded to a 48" diameter and by reversing the wheel it may be collapsed to 20". At any size it is braced, locked and round. Any size culvert between 20" and 48" can be built over it, and after the concrete has set the form is collapsed by reversing the hand-wheel, and removed. Another exclusive feature of the Merillat Adjustable Core is the trucks with which it is supplied and which automatically fold within the form when not in use.

A culvert form that is adjustable to different sizes is just what contractors and road supervisors have long been looking for, as one form enables them to build all the different sizes of culverts, and they need no longer buy a number of different sizes of forms. The Merillat people have sold as high as twenty cores to township boards in one county in Kansas and at the Nebraska Cement Users' Association Show at Lincoln,



LAYING CONCRETE WITH THE MERILLAT CULVERT CORE.



REMOVING MERILLAT CULVERT CORE—IT IS COLLAPSIBLE.

Neb., this month, they sold twenty-four cores to concrete contractors in two days, which proves that their machine meets with the approval of road workers and contractors alike.

The accompanying pictures show three stages in the construction of a 26" concrete culvert, 32' long. A culvert of any other diameter or length could be built just as well with the same machine.

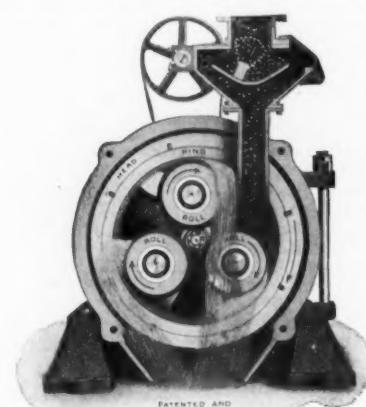
The Ring-Roll Mill manufactured by the Sturtevant Mill Company, of Boston, Mass., differs considerably from the other cement pulverizers of the roller mill class, and because of this difference the manufacturers claim great advantages.

Its grinding action is best illustrated in the "working" cut shown herewith. It will be seen that the product from an ordinary crusher (2-inch and finer) is automatically fed through the spout and delivered at the center of a wide revolving ring or tire, where it is firmly held by the centrifugal force, generated by the ring's rotation, thus forming a thick, protective layer of rock 1-inch in thickness over the entire surface of the ring.

The three convex-faced rolls, all set up by one adjusting screw on the outside of the door, are strongly and equally pressed by springs towards the revolving concave face of the ring. They are forced by frictional contact, with material thereon, to roll

and the stresses exactly balance and offset each other.

With the open door arrangement the whole front of the mill case opens like the massive door of a safe, and carries the rolls and all their parts entirely outside of the mill, exposing the whole interior. The ring (R), which is the only working part left inside, can be quickly reached. When the door closes, it swings the rolls back into the interior space of the ring (R) and then all are equally and elastically pressed by one screw on the outside of the door, and as strongly as is needed to crush at once any grindable material held on the ring. The ring (R) discharges its rock on both sides of the concave track. Ability to open the door quickly often saves time, an important consideration even in small works. The mill case has other openings, too, that are convenient.



RING-ROLL STURTEVANT MILL IN OPERATION.

Actual tests with these machines show the following results:

Cement Clinker: 60 bbls. per hour to 20 mesh; 15 to 20 bbls. per hour to 97%-100 mesh.

Limestone: 10 tons per hour to 20 mesh; 5 tons per hour to 98%-100 mesh.

Coal: 5 tons per hour to 98%-100 mesh.

Power tests show 25 to 30 horsepower for fine work and 30 to 40 horsepower for preliminary grinding.



BOTTOM-DUMP TROY WAGON.

over and pulverize it by the centrifugal force, generated by ring rotations which holds material on the ring until it is crushed fine, and then the rolls crowd the fines off of both sides of the ring's track as fast as produced.

A naked track is never exposed to the roll faces. Rock is crushed down upon itself, between anvil ring and hammer roll, producing a maximum of fines with least wear.

The spring-pressed rolls are adjusted to crush at from 20,000 to 40,000 pounds pressure, more or less as is found effective. This is greater than the track pressures of locomotive wheels; and the high-power steel axles of the Sturtevant mill are stronger. These elastically and equally pressed rolls are balanced and pass over iron or uncrushable substances with shocks so completely cushioned that crystallization or breakage is prevented.

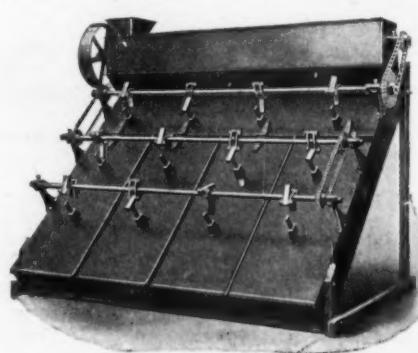
Such simple and effective roll and ring action is unusual. Because the rolls cannot touch the ring, protected as its face is by the thick layer of material on it, wear of the ring is almost nil, and because, unlike others, these rolls do not slip, wear of these too is of slight consequence. This mill cannot be clogged however rapid the feed may be.

As there is a constant feed while the mill is at work on coarse and partly reduced material, so there is a constant drop of material crushed off of both sides of the ring by the rolls. This escapes to the bottom of the case, from whence it is taken to a Newaygo screen to remove the finished product as soon as made. The tailings, separated by this most effective of all screens, are returned to the ring, with fresh feed, for further reduction. Thus the mill is always grinding new material and producing a maximum output.

The driving shaft carries only the weight of the parts which it revolves. It takes no crushing shocks. The roll pressures are exactly equal and opposite,

The Construction Service Co. has been making an exhaustive investigation of the efficiency of the bottom-dump wagons made by the Troy Wagon Works Co., of Troy, O. The results of this investigation are incorporated in a report which is of vital importance to all men engaged in construction work in which wagons are used, the tests being made under the most exacting conditions. Four separate tests, each radically different in nature, were made. The outcome of these, it is reported, proved that there is not only a marked saving in time, but also a very decided actual money saving in the use of the Troy company's wagons. These wagons are made for all purposes, country road building, canal and railway construction, municipal uses, etc. One factor in the economy of time is a foot lever, by pressing which the driver dumps his load immediately. A winding lever at the side of the wagon box enables him to close the bottom quickly. This is only one of half a dozen or more forms of wagons made by this company. A postal to the Troy Wagon Works Co. at Troy, O., will bring by return mail booklets descriptive of the company's varied output.

P. B. Beery, who is selling the new Allentown brand of cement, blithely says that he is happy because he knows that he now has a brand in which no one can "Matcham."



THE NEWAYGO SCREEN.

New Collapsible Concrete Mold.

Marked advance has been made in culvert construction by the use of the collapsible steel forms made by the Miracle Pressed Stone Co., of Minneapolis. There is no longer any question as to the merits of concrete in this form of construction. The great problem has been how to secure the desired results in the quickest and most economical manner. This now appears to be solved by the use of the new collapsible forms. These forms are used as a core, around which the concrete is laid. When this has set the form is collapsed and withdrawn. By this method culverts have been made and put into service within forty-eight hours from the time the work was started.

One instance of this kind occurred on the Lincoln (Neb.) boulevard, near the home of William Jennings Bryan. The work of construction, so far as the placing of the concrete is concerned, was begun on Monday, April 26. Forty-eight hours later the culvert sustained the weight of six good-sized horses and two men directly over the center without signs of deflection. In this job two forms were used. They were withdrawn in just four minutes by one man who used a small block and tackle.

The usual length of these forms is 10 feet. Culverts of any desired dimension may be built by placing the required number of forms end to end. As the average is 20 feet two forms are generally sufficient. This device is the outcome of three years of study and experiment and, to use a time-worn phrase, "fill a long-felt want."

Taking the country over, it is estimated that on the average every county builds fifty culverts a year—that is new culverts and old ones replaced.

In years past practically all culverts were made of wood—more or less well built, according to the character of the man who did the work, and the amount of money and character of material used.

The "Good Roads Movement" has brought in its train specialization in various lines, including, besides surfacing and gradients, nothing more important than a radical change in the construction of culverts.

Wood culverts rot out, are washed out or broken down so soon that in the end a large expenditure is involved in what, judged by "first cost," would seem to be the cheapest of all materials. It is now the almost universal opinion that the wood culvert is a thing of the past—only to be used as a temporary expedient.

But what makes the best culvert? Wherever this matter is broadly considered, concrete, the modern building material, is generally found to have the strongest claims. Twenty years ago—or even possibly ten years ago—this might not have been true. But the cost of cement is now so low, its use so universal, that it can be bought in practically every civilized community, and the knowledge of concrete, as well as special skill in working in this great modern material, is so general that it may be said that "everybody knows about concrete."

Concrete has two advantages. It is cheap in the first cost, and it will last so long, when properly made, that the common expression is "concrete lasts forever."

It is quite surprising how great is the capacity of a culvert. In other words, it does not take a very large culvert to carry off the water from a considerable watershed. The main point is to see that the ends are well protected with wings so that there is no chance for washing at either end. This is said to

be one of the principal advantages of the one-piece culvert made with the collapsible steel mold.

There are two methods of handling the concrete culvert business. One of these is when the county and township authorities buy the collapsible steel forms and have the work done by day labor under the charge of some competent foreman.

The other is the ordinary letting of the jobs by contract to some local man who makes concrete work a business. In either event it costs about the same amount to the public for good work.

Clean sand, gravel and water are generally easy to find; cement is now very cheap. The work of making a concrete culvert is simple when using these collapsible steel forms. Usually all it requires is to dig a trench, lay a foundation of concrete in the bottom, then put the culvert form in place, being careful to give it sufficient pitch to carry off the water, etc. The only use ordinarily for lumber is in making the wings, this lumber being used over and over again like the form. When the form is in position the cement is placed around and over it, with reinforcing metal over the top on the larger sizes. After the concrete is set the form is collapsed and withdrawn and is ready for use again.

Those who desire more complete information by writing to the Miracle Pressed Stone Co., Minneapolis, Minn., asking for Catalogue Z, will receive a well-illustrated booklet covering the subject in detail.

New Company Formed.

The Marsh-Capron Manufacturing Company is the style of the new firm which has succeeded the Marsh Company, with offices in the Old Colony Building, Chicago. Comparatively everyone engaged in the crushed rock or concrete mills business knows George E. Marsh, as he has been identified with the business for many years. He has designed and constructed many plants and is considered one of the greatest authorities in the country.

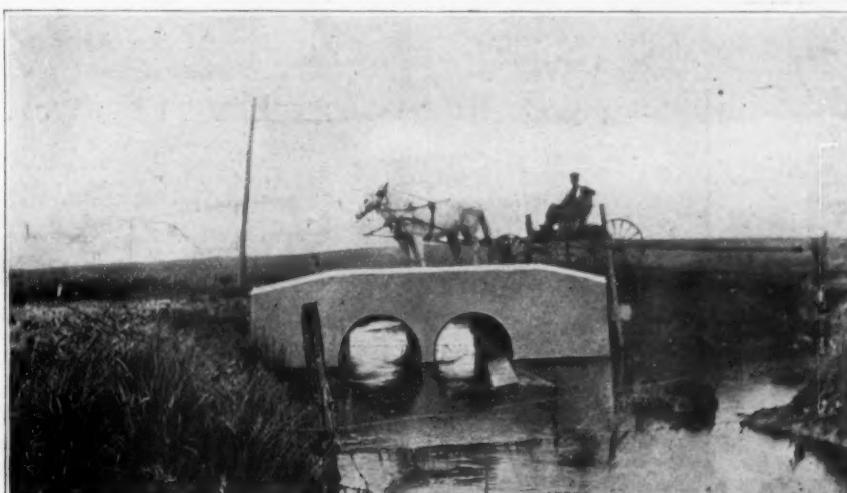
H. M. Capron, who has joined the firm, was the president and manager of the Chicago Builders' Specialty Company, who have heretofore been selling the Koehring concrete mixer and other contractors' specialties. Mr. Capron has had large experience in handling concrete mixers and other specialties of this class and has a large acquaintance in the trade.

The Marsh-Capron Manufacturing Company have purchased two and a half acres of land and a modern brick factory, 80x250 feet, to be equipped with the most modern machinery, and are already building some of its specialties there. The new rail M. C. concrete mixer which they are showing at booths 51-52-53 at the Chicago Cement Show was built in the new factory, which is in charge of Mr. Mosby, formerly general manager of the Reliance Iron Works, of St. Louis.

Big Deal Made in Ohio.

CLEVELAND, O., Feb. 19.—The Biggs Mfg. Co., of this city has bought the eave trough and conductor pipe business of the Thomas Steel Co., Niles, Ohio, including all of the machinery, fixtures and stock on hand, besides taking over all of the Thomas Steel Co.'s contracts, amounting to over two million feet.

As the Thomas Steel Co. has been making eave trough and conductor pipe less than two years, the machinery is practically new, and of the latest design. This additional machinery will give the Biggs Company an annual capacity of twelve million feet of pipe and gutter.



CULVERT MADE BY MIRACLE'S COLLAPSIBLE CONCRETE CULVERT MOLD.

CLASSIFIED ADVERTISEMENTS

Advertisements will be inserted in this section at the following rates:

For one insertion	25 cents a line
For two insertions	45 cents a line
For three insertions	60 cents a line

Eight words of ordinary length make one line.

Heading counts as two lines.

No display except the headings can be admitted.

Remittances should accompany the order. No extra charges for copies of paper containing the advertisement.

EMPLOYEES WANTED**WANTED.**

If you are in need of or wish to sell anything which comes under any of these classifications, write us. If you have something not coming under these classifications we will create one for you.

MARCH 1ST, 1910.

Wanted—Outside superintendent for lime kilns and quarry. Must have experience and be capable of handling 100 men. Give references and salary wanted.
Address "B," care Rock Products.

SUPERINTENDENT WANTED

for lime plant. Must be competent. References required.
Address EAGLE LIME PRODUCTS CO.,
Pereles Bldg., Milwaukee, Wis.

A SUPERINTENDENT

wanted for plaster mill. Must be thoroughly practical.
State experience and salary expected.
Address "PLASTER," care Rock Products.

PLASTER SALESMAN

wanted. Experienced. State experience and salary expected.
Address "PLASTER," care Rock Products.

FIRST-CLASS QUARRY SUPERINTENDENT

wanted. By large crushed limestone company. Excellent opening if you have ability. Address W., care Rock Products, stating salary expected.

LICENSED ENGINEER

wanted. Capable of taking charge of gravel screening plant. Salary or percentage basis. State experience, references and salary expected.
Address P. O. BOX 356, Dayton, Ohio.

A CEMENT CHEMIST

wanted. Experienced in "wet" process, marl and clay.
Address "NO. 753," care Rock Products.

EMPLOYMENT WANTED**POSITION AS SUPERINTENDENT**

wanted by middle aged married man with quarry, crusher, lime burning and business experience. Sober, industrious and reliable. References.
Address BOX 748, care Rock Products.

POSITION AS SUPERINTENDENT

wanted, of lime burning or stone crushing plant. Am familiar with every detail of each. Best of references.
Address BOX 743, care Rock Products.

PRACTICAL MAN

wants position. Capable of handling large modern lime plant, etc., in any capacity up to works manager. First class references.
Address M. E. WAGNER,
24 The Schmidt, Toledo, O.

TRAVELING SALESMAN POSITION

wanted. By traveling salesman, several years' experience, cements, plaster and building material. First class reference. Address BOX 736, care Rock Products.

BUSINESS OPPORTUNITIES**WHITE SILICA SAND.**

Our white silica sand is used extensively by marble-works, foundries, plasterers, etc. Prices and samples on request.
HOFFMANSTONE CO.
670 W. Water St., St. Paul, Minn.

MATERIAL FOR SALE

Eight feet of gypsum rock; analysis 94 to 96%; one mile from four railroads. Call and see the cores.
Address M. J. SKIVINGTON, Munford, N. Y.

FEBRUARY 22, 1910.

PLANT FOR SALE**FOR SALE OR LEASE.**

The most modern and up-to-date sand-lime brick plant in the South; capacity 20,000; located on the N. & S. Ry., a short distance from Norfolk; 12 acres of huge banks of the finest silica sand.

The product is well introduced, several million brick have been sold, and the entire output can be readily placed at good prices.

Reason for selling, death of president, general manager and largest stockholder, who only knew anything pertaining to the business.

A rare opportunity for anyone understanding the business and worthy of thorough investigation. Address CAPE HENRY GRANITE-BRICK CORP., Norfolk, Va.

THE ANTON VOGT KILN CONSTRUCTION CO.

Plans Submitted for Down Draft Kilns for all Purposes.

OUR SPECIALTY

A Superior Kiln for Common Brick
that is AS CHEAP AS an up Draft Kiln.

FORT SMITH,

ARKANSAS

The UNIVERSAL is Not in the Trust

We are not paying a big salary to our president.

30% You Will Save 30%

Quality and prices are our salesmen.

We Sell Direct to You

Investigate All. Buy the best, [fully
guaranteed]

CRUSHER

Simple and inexpensive Crusher Plants our specialty.

Don't be Misled. See Our Trial Offer.
Get our Bulletin No. 4

CALL OR ADDRESS

UNIVERSAL CRUSHER COMPANY
Works, 2nd Ave. and 10th St. West 'Phone 1115
Cedar Rapids, Iowa.

FOR IMMEDIATE SHIPMENT NEW AND REBUILT CONTRACTORS' AND MUNICIPAL MACHINERY.

One Rebuilt "good as new" New Era Elevating Grader. Rebuilt Jaw Crushers, and Reversible Graders of all Standard Makes. One 28 H. P. Robinson Traction Engine Thoroughly Rebuilt; a bargain. One 12 H. P. Springfield Traction Engine Rebuilt Throughout.

HEADQUARTERS FOR Concrete Mixers, Wheelbarrows, Gasoline Engines, Gyratory and Jaw Crushers, Cars, Hoist and everything in Quarry Equipment. Write us for catalogue and prices.

THE WILLIAMS CONTRACTORS' SUPPLY CO., Columbus, Ohio

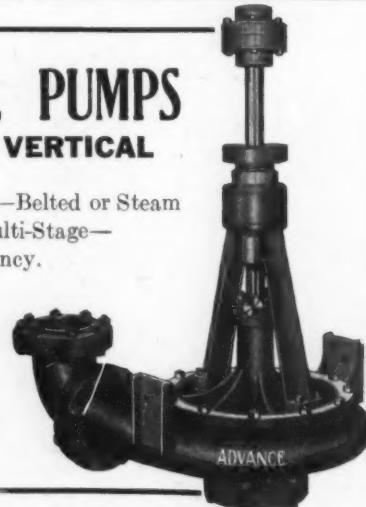
CENTRIFUGAL PUMPS

HORIZONTAL — VERTICAL

Direct Connected to Motors—Belted or Steam Driven — Single or Multi-Stage— Highest Efficiency.

Ask for Catalog 62.

Advance Pump and Compressor Company
Battle Creek, Mich.

**MACHINERY FOR SALE****STURTEVANT ROTARY CRUSHER**

No. 2 "Open Door" rotary. Used less than 30 days. Fine condition. Bargain. Address BORTON-TIERNEY CO., Stephen Girard Bldg., Philadelphia, Pa.

Machinery and Material

FOR SALE—Comprising Quarry and Stone Plant, at Belleville, N. J.

3 Lidgerwood cableways with engines.

4 F. R. Patch gang saws.

1 F. R. Patch rip saw.

1 14' F. R. Patch undergeared rubbing bed.

2 Stone planers 42" x 42" x 10'.

6 Rand Little Giant Drills. (steam)

1 Ingersoll steam channerel.

4 Large steam pumps.

3 Guy derricks, 1 stiff log derrick.

1 50 H. P. vertical engines.

1 100 H. P. Horizontal engine.

1 100 H. P. Horizontal boiler.

1 25 ton 70' traveling crane, cable driven.

50 Tons rail, 20, 30, 40, 60 lb.

Transfer and stone cars, chains, drilling and channeling bars, pipe, shafting, belting, etc.

L. F. SEYFERT'S SONS, Inc.

437-441 N. 3rd St. - - - PHILADELPHIA PA.

Marsh's Crusher List

1 No. 8 Gates Plant complete.

1 No. 7½ Gates Plant complete.

1 No. 7½ Austin Crusher only.

1 No. 6 Gates Crusher only.

1 No. 5 Austin Crusher only.

1 No. 5 Gates Crusher only.

2 No. 3 Gates Crushers.

1 No. 4 Gates Crusher.

1 17x24 Buchanan Jaw Crusher,

made by Geo. V. Cresson & Co., Philadelphia.

We also have a lot of crushers of various makes at a great bargain.

All of the above crushers are absolutely first-class. In addition, we have for sale:

2 75-Ton Steam Shovels, almost new, equipped with 3½ yd. dippers and built especially for loading stone.

MARSH-CAPRON MFG. CO., 903 Old Colony Bldg., Chicago

Watch
our
Classified
Section
for
Bargains.

If You
Want a
Position
or need an
Employee
an Ad
placed
there will
Supply You.

NEW HAYDEN CEMENT MIXER

for sale; bottom price. Address
FRANK BLACKLEDGE,
State Life Bldg., Indianapolis, Ind.

FOR SALE.

One four mold Simpson dry press.

One Fernholz pulverizer.

One 40 H. P. engine and boiler. Also shafting, pulleys,

etc. Have extra mold box for dry press.

Will sell all or any part of this machinery.

Address ED SHANNON, Shellisburg, Ia.

FOR SALE.

2—75 ft. x 6 ft. hardening cylinders.

1—4 mould Chisholm, Boyd & White brick press. Capacity, 20,000 per day of 10 hours.

1—4 mould Chisholm, Boyd & White combination brick and block press. Capacity, 20,000 per day of 10 hours.

1—Rotary brick press. Capacity, 10,000 per day of 10 hours.

100—Brick cars, capacity 1,000 bricks.

Also miscellaneous brick machinery. All new and in first class condition. Will sell cheap. Inspection invited.

Address ARTESIAN STONE & LIME WORKS CO.,

308 Chamber of Commerce Bldg., Chicago, Ill.

IMPORTANT**Advertisers—Take Notice****Changes of Copy**

Must be in this office by the Fifteenth of the month, if proofs are desired; if no proofs are required the desired changes can be made if copy is received by noon of the Nineteenth.

New Advertisements

To insure proper classification, should be in this office by the Fifteenth of the month, but they can be inserted in the last form going to press if received by the Nineteenth. The punctual publication of the paper admits no deviation from these rules. Advertisers are earnestly requested to co-operate with us.

THE FRANCIS PUBLISHING COMPANY

355 Dearborn Street, Chicago, Ill.

**Fast Trains
Day
and
Night**
on the

MONON ROUTE

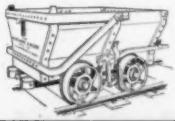
**EXCELLENT SERVICE
BETWEEN**

Chicago**La Fayette****Indianapolis****Cincinnati****Dayton****West Baden and****French Lick Springs****Louisville**

Electric Lighted Standard Sleepers on Night
Trains, Parlor and Dining Cars on Day Trains

Frank J. Reed, G.P.A. E. P. Cockrell, A.G.P.
CHICAGO

THE HENRY MARTIN BRICK MACHINE MFG. CO.
LANCASTER, PENNA.
ROCK CRUSHING MACHINERY
BRICK-MAKING MACHINERY
CLAY WORKING APPLIANCES
CEMENT BRICK
MACHINERY
SAND GRINDING
MACHINERY
SAND DRYERS, BRICK DRYERS, ETC.
SEND FOR PLANS AND ILLUSTRATED CATALOGUE

"K & J" CARS
FOR QUARRIES

"K & J"

This is a "K & J" End Dump Quarry Car, having a steel plate body, self-oiling wheels, hand brake and wood bumpers. Cap'y 1½ cu. yds. Gauge track 36 in.
We Build Every Type of Car that Quarry Work Demands.
Catalog 66-J.
"K & J" Cars are built for "Continuous Service."
The Kilbourne & Jacobs Mfg. Co.

Plant and General Office, COLUMBUS, O. NEW YORK 25 Broad St

WE DESIRE TO CORRESPOND WITH

Manufacturers of Construction and Paving Materials

With a view to representing them in New York and vicinity.

We have a thorough knowledge of selling conditions in that field and a complete organization for securing business.

Address XYZ, care of ROCK PRODUCTS.



Leviathan Belting

MAIN BELTING COMPANY, Market and Randolph Sts., CHICAGO, ILLINOIS

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Little Co., C. H.

BALL MILLS.

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Power & Mining Mch. Co.

BELTING.

Chicago Belting Co.
Gandy Belting Co.
Main Belting Co.
Sawyer Belting Co.

BRICK.

Harbison-Walker Refractories Co.

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Kilbourne & Jacobs Mfg. Co.
Sackett Screen & Chute Co., H. B.

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Wisconsin Lime & Cement Co.
Sackett Screen & Chute Co., H. B.

BURR STONES.

Charles, J. M.

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Martin-Henry Brick Machine Mfg. Co.
Oklahoma & Texas Cement Brick Co.
Peerless Brick Machine Co.

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Blane White Portland Cement Co.
Carolina Portland Cement Co.
Chicago Portland Cement Co.
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Dixie Portland Cement Co.
Edison Portland Cement Co.
German-American Portland Cement Co.
French, Samuel H., & Co.
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Anchor Concrete Stone Co.
Century Cement Mch. Co.
Centrifugal Concrete Machine Co.
Concrete Stone & Sand Co.
Keller Concrete Machine Co.
Learner Co., The P. H.
Miracle Pressed Stone Co.
Perfection Block Mch. Co.
Pettyjohn, The Co.
Simpson Cement Mold Co.
Sioux City Cement Mch. Co.
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Learner Co., The P. H.

CONCRETE MIXERS.

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Cement Tile Mch. Co.
Keller Concrete Machine Co.
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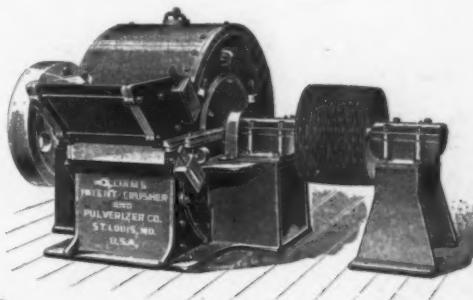
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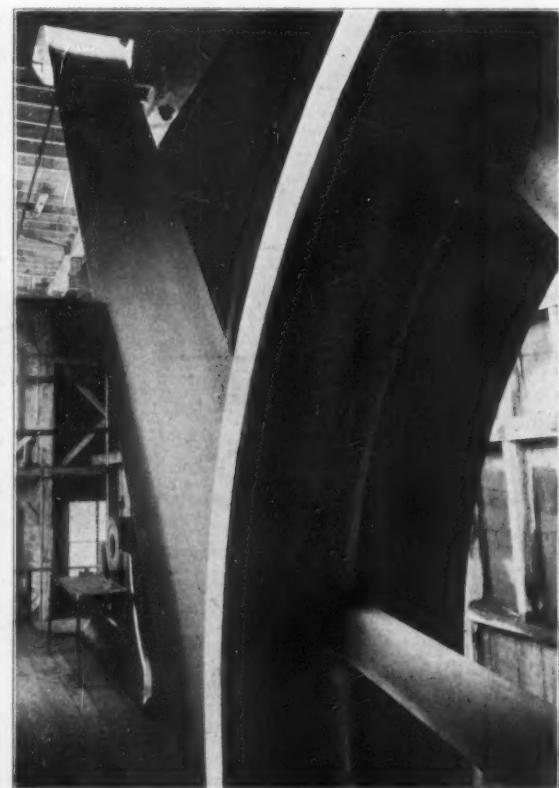
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143 FEET—36 INCH—10 PLY.
Largest amount of stretch cut
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This Belt was installed March 1st, 1906, replacing one four times its cost, which had proven unsatisfactory.

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The upper, or driving pulley is 54½" diam., 154 revs. per minute; the lower, or driven pulley, 190" diam., 44.17 rev. per minute. The belt has been in continuous use 144 hours per week since March 1st, 1906, and is transmitting a steady load of 350 horse power.

We have no better running belt in our mills.

NAME TO INTERESTED PARTIES ON REQUEST.

Estimates furnished—Address ENGINEERING DEPARTMENT

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Red, Brown, Buff and Black



MORTAR
COLORS

The Strongest and
Most Economical
in the Market.



Our Metallic Paints and Mortar Colors are unsurpassed in strength, fineness, and body, durability, covering power and permanency of color. Write for samples and quotations.

CHATTANOOGA PAINT CO.

Chattanooga, Tennessee

TWENTY LONG YEARS

of time and weather tried out Ricketson famous "Red Brick" Brand.

COLOR

for Mortar, Brick, Cement, Stone, etc., and proved it to be absolutely permanent. Red, Brown, Buff, Purple and Black.

Ricketson Mineral Paint Works
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Save 25 per cent in the cost of mixing concrete by using an

Improved Coltrin Mixer

It requires less men and less power to operate than any other mixer on the market today.

Two new features are the hood on the discharge and the automatic regulator for proportioning the materials.

We ship these mixers on approval for five days' trial. For prices, etc., address

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THE ABOVE MACHINE IS OUR LAST YEAR'S STYLE.

1910 MODEL WILL BE ILLUSTRATED NEXT MONTH.

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MILWAUKEE MIXER



A solid cast steel drum. Guaranteed for Five Years. All steel construction. No blocking up—No clogging—No balling—No slopping—No legs or extra props to support frame—No wooden frames—No bevel gears. **DOES THIS APPEAL TO YOU?** WE ARE DETERMINED TO GIVE YOU MORE VALUE FOR YOUR MONEY. Will not cost you any more than the old style sheet iron drums with wooden frames.

Meet us at the Cement Show, Chicago, February 18-26, and talk it over. Booth 207.

READ OUR PROPOSITION

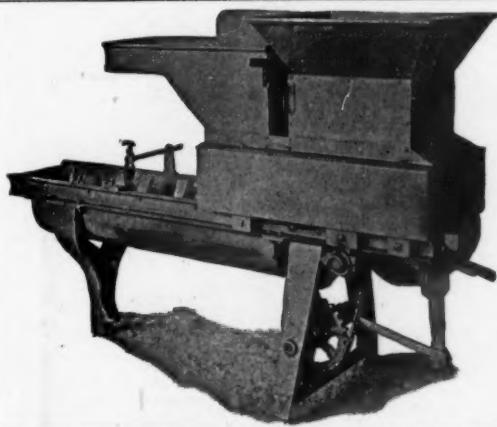
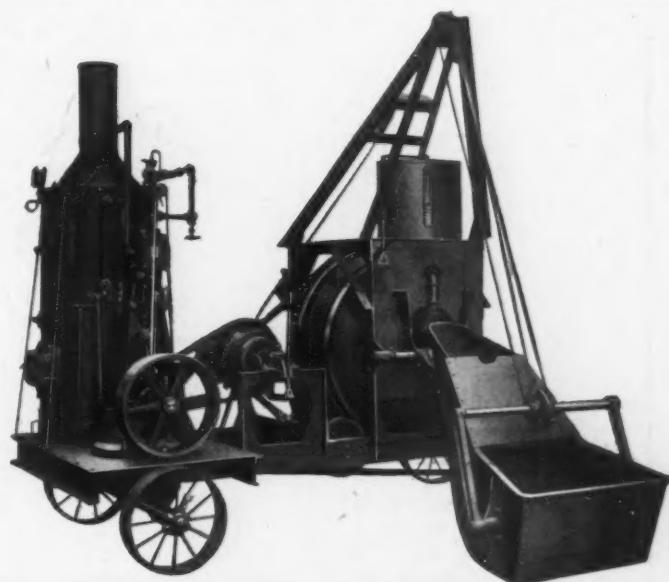
OUR PROPOSITION: We will put a MILWAUKEE on your work—use it for five days, and if in your opinion (not ours), it is not superior (not equal), but superior to any mixer you have ever seen or used, return it, and we will pay freight both ways. Isn't this the fairest proposition you ever heard of?

Write for catalogue

Milwaukee Concrete Mixer & Machinery Co.

MILWAUKEE, WIS., U. S. A.

REPRESENTATIVES WANTED IN UNOCCUPIED TERRITORY



"KENT" CONTINUOUS MIXER

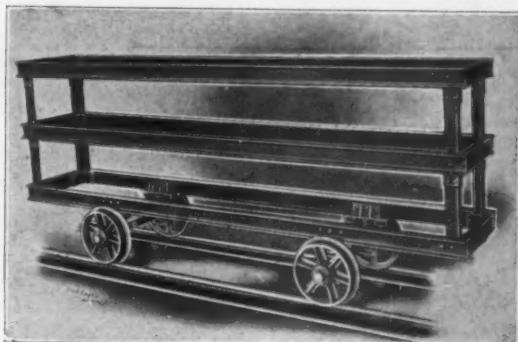
"The Mixer that measures and Mixes"

"You fill the Hopper, the Mixer does the rest"

Simple, reliable, economical, durable and moderate in price

Write for Catalogue and Prices to

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The "KENT" Block Cars, Transfer Cars, etc.



Deep Blast Hole Drilling

Is accomplished more economically than by any other method with the

"American" Drilling Machines

There is 40 years' experience behind these drills—they are standard.

Where electric power is available, equipped with motor they form the most portable and economical drill for quarry use.

Equipped with any power they are backed by the experience and reputation of the world's oldest and largest builders of this kind of drilling machinery.

Tell us your blast hole requirements. We have 59 regular styles and sizes of machines for your selection, made in types to meet every possible condition of work.

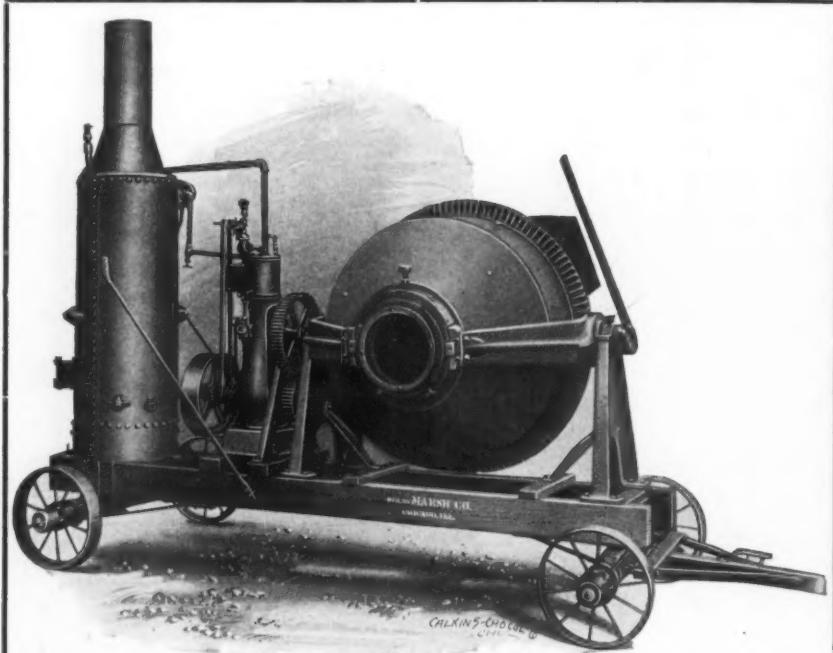
Write for our new catalog No. 105, the most complete "Drill-Hole" catalog ever issued.

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MARSH^{UP-TO-DATE} LINE OF MIXERS

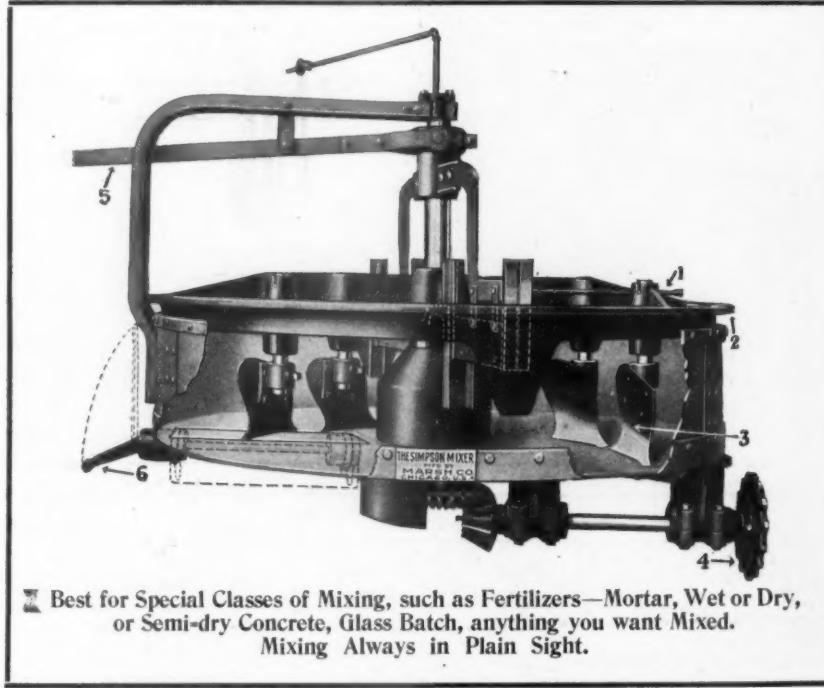


MARSH-DEXTER—Best and Simplest Tilting Mixer. Note absence of complicated gearing which add to weight but not to strength.

The result of 7 years' experience selling mixers, meeting 10,000 to 15,000 practical Buyers, Contractors, Engineers, Architects, their advice and experience, **your** experience, our experience, the combined experience which has enabled us to produce a line of

MIXERS

which comes nearest of meeting **all** the requirements of **all conditions** met in actual use. Not just one type of machine which must be made to do for all kinds of work, whether adapted to it or not, but **different** types to fit varying conditions.



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MARSH-CAPRON MFG. CO.

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THE DRUM of the POLYGON CONCRETE MIXER is the

greatest advance in Concrete Mixing since the first use of machinery for this purpose. It is formed by two truncated cones mounted on the heads of a cylindrical drum, the original axis of which is inclined at an angle of 45 degrees to the main axis of the Mixer.

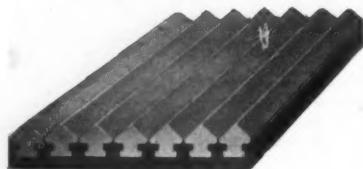


If you're a user of Concrete it's plain "horse sense" to investigate the POLYGON CONCRETE MIXER. See it at the CHICAGO CEMENT SHOW. Send for Catalog, etc., and get in touch with the "POLYGON PRINCIPLE" then you will understand why it's "THE MIXER THAT MAKES THE MONEY."

Waterloo Cement Machinery Corporation WATERLOO,
IOWA, U.S.A.

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A Tempered Steel Jaw Plate for Blake Type Crushers



Canda Tempered Steel Crusher Jaw Plate

Patented March 31, 1908

The Canda Tempered Steel Jaw Plate for Blake Crushers is composed of Forged and Rolled Chrome Steel Bars, cast-welded and also mechanically interlocked into a backing of tough steel—and the wearing face is tempered to extreme hardness. We are equipped to supply both corrugated and smooth face plates for all sizes and makes of Blake Crushers.

The Canda method of cast-welding forged and tempered steel bars into a mild and tough Steel Backing, is adapted also to the construction of Cone Heads for Gyrotary Crushers, Segments for Corrugated Rolls, etc., etc.

Our products in this line are sold with our special guarantee that they will wear longer, give better satisfaction and, at our price, prove more economical than any others now on the market.

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For boring anything that
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Awarded Gold Medal, St. Louis.

We make 40 different styles machines run by Hand, Compressed Air and Electricity for boring Fire Clay, Coal, Rock, Rock Salt, Gypsum and Plaster Rock. Send to day for our handsomely Illustrated Catalogue.

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(ESTABLISHED 1878.)

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THE GENERAL CRUSHED STONE CO.,
So. Bethlehem, Pennsylvania,
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capacity 400 tons an hour.

THE C. O. BARTLETT & SNOW CO. CLEVELAND, OHIO.

FARREL ORE AND ROCK CRUSHER

USED IN ALL PARTS OF THE WORLD—LARGE RECEIVING CAPACITY—SPECIALLY DESIGNED AND CONSTRUCTED FOR HARDEST KIND OF WORK

COMPLETE CRUSHING PLANTS OUR SPECIALTY

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GENUINE
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Parts for all makes of crushers, as
JAWS, CHEEKS, TOGGLES and BEARINGS
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STEAM SHOVEL TEETH, POINTS and BASES
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Will Pay for Itself

In three days by handling brick over the old method.

By saving twenty-five per cent. time unloading a car of brick.

By not making a mistake in the count, as they can be adjusted from four paving brick to twelve regular.

By saving from 50c to \$1.00 on every thousand pressed brick by not chipping.

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THE ONLY TOOL TO HANDLE BRICK

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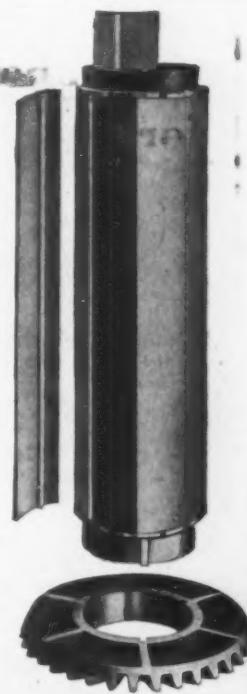
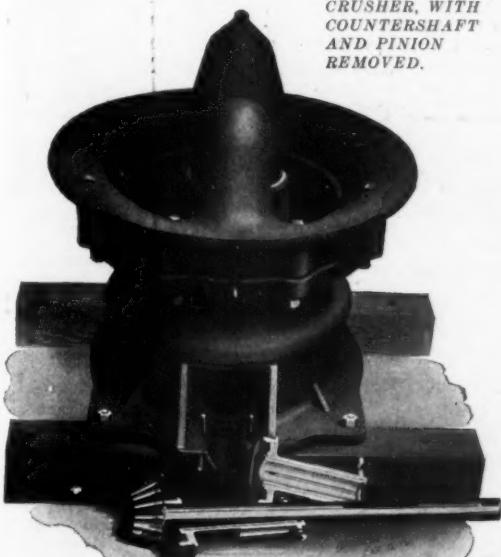
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950 East 67th St., Cleveland, O.

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SYMONS CRUSHER

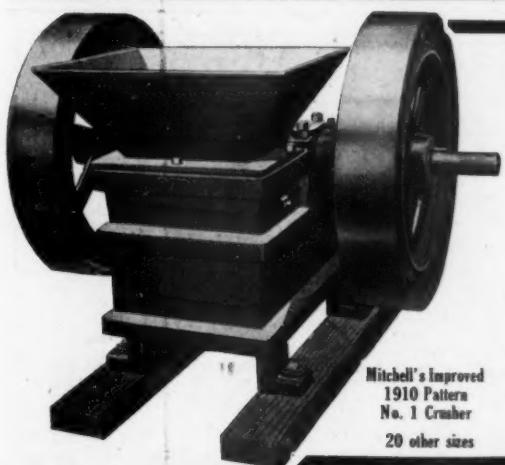
SYMONS STYLE C
CRUSHER, WITH
COUNTERSHAFT
AND PINION
REMOVED.

SYMONS ECCENTRIC,
SECTIONAL
BABBITT AND
DETACHABLE
GEAR.



IT does not take an expert to gauge the merit of the SYMONS CRUSHER. It is the "gyratory" idea, reduced to its simplest elements, with all useless metal and unnecessary parts eliminated. The main shaft is fixed, forming a huge central bolt, about which revolves the eccentric, shown in the picture. Dust proof and automatically oiled, the long eccentric bearings tell a plain story of reliable and economic operation, of long life and low repair cost. Babbitt is furnished to the user in sections, which can be fitted into the eccentric in record-breaking time, without the annoyances usually experienced by crusher men in babbitting eccentric bearings. The countershaft and driving pinion may be easily removed, as indicated in the second illustration. Time and money savers—these features. Don't they interest you? Write for catalog No. 166.

THE T. L. SMITH CO.
301 Old Colony Bldg., CHICAGO, ILL.
Majestic Bldg., MILWAUKEE, WIS.



Mitchell's Improved
1910 Pattern
No. 1 Crusher
20 other sizes

THE ONLY CRUSHER

that can be instantly adjusted to crush rock to any desired size. We make broader claims for our machines than this—they will crush rock from 3 inch to 4 inch down to sand and pea size in one operation.

The capacity depends upon the size of
the machine—we make 20 different ones

All wearing parts are of Manganese steel, specially designed to stand the "hard knocks." We can tell you more about them in our new No. 5R Catalogue—write for it.

Eureka Stone & Ore Crusher Co.
CEDAR RAPIDS, IOWA



AUSTIN GYRATORY CRUSHER

The World's leading rock and ore breaker.

The only self lubricating Crusher.

The only Crusher having double countershaft bearing.

Simple construction, correct design.

Thousands in use.

Plans and specifications furnished for any sized plant.

Send for Catalogue No. 17.

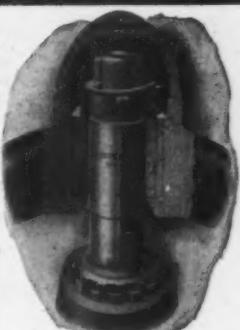
All experienced users recognize that the efficiency and durability of the suspension bearing as applied to Gyratory Crushers, depends upon locating the bearing at the point of least gyration or movement of the main shaft.

A perfect suspension can be made only by locating the bearing at the point where there is no movement of the shaft. That being a mechanical impossibility it follows that superiority is obtained in fixing the bearing at the point of least gyration of the shaft.

As the accompanying cut will show, the movement of the shaft at the point of suspension in the Austin Crusher is reduced to the minimum and practically eliminated. Consequently the highest possible degree of efficiency and durability is obtained.

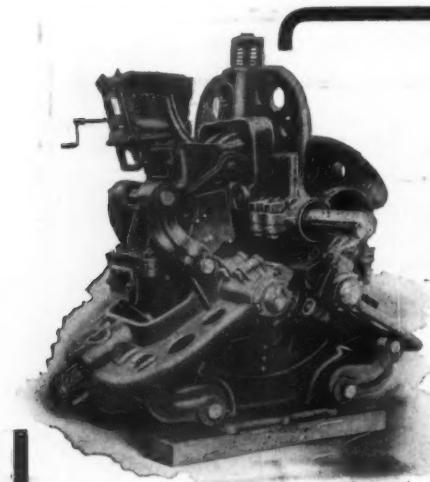
Austin Manufacturing Co., Chicago

Mussens Ltd., Montreal, Can., Canadian Sales Agents.



New York City Office
1682 FULTON BUILDING
Hudson Terminal

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See it at the Cement Show, Coliseum, Chicago, Feb. 18 to 26, 1910

MAXECON

Means MAXimum of ECONomy

Years of experience with the assistance of our hundreds of customers has found THE SOLUTION OF GRINDING HARD MATERIALS. The MAXECON PULVERIZER combines highest EFFICIENCY, greatest DURABILITY and assured RELIABILITY. Uses the LEAST HORSE POWER per capacity. Embodies the features of our Kent Mill with improvements that make it MAXECON.

**WE DO NOT CLAIM ALL of the CREDIT
for this achievement**

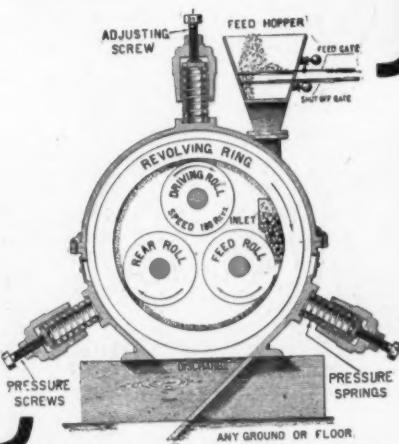
We have enjoyed the valuable suggestions of the engineers of the Universal Portland Cement Co. (U. S. Steel Corp.), Sandusky P. C. Co., Chicago Portland C. Co., Marquette Cement Mfg. Co., Western P. C. Co., W. H. Harding, Prest., Coplay P. C. Co., Cowham Engineering Co., Ironton P. C. Co., Alpena P. C. Co., Castalia P. C. Co., Pennsylvania P. C. Co., and many other patrons.

THE RING WOBBLERS

The FREE WOBBLING POUNDING RING instantly and automatically ADAPTS its position to the variations of work. Its GRINDING ACTION is DIFFERENT than any other; besides the STRAIGHT rolling action of the rolls, the SIDE to SIDE motion of the ring makes the material subject to TWO crushing forces and DOUBLE OUTPUT results.

KENT MILL CO.

170 BROADWAY, NEW YORK CITY
LONDON, W. C., 31 HIGH HOLBORN
CHARLOTTENBURG 5, WINDSCHEID STRASSE 40, BERLIN



Concrete Culverts and Sewers

present a new field for the concrete contractor, one in which there is little competition, and therefore the profits are large.

The Merillat Adjustable Core

for making concrete culverts is adjustable, expandable, collapsible, and portable. It is entirely automatic, and the **one** form makes every size between 20 and 48 inches in diameter.



Why buy a form that makes but one size, when ours, which makes every size, costs no more?

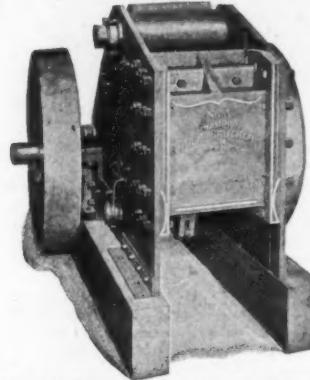
At the Nebraska Cement Users Association Show at Lincoln, we sold 24 cores in two days.

There is a **reason**, and a visit to our Booths Nos. 248 and 249 at the Chicago Cement Show will explain it.

GET OUR CATALOG.

SALESMEN WANTED.

THE MERILLAT CULVERT CORE CO.
Box 1, WINFIELD, IOWA



No. 5 Champion Steel Rock Crusher, 11x26 in. Opening.

Speaking of ROCK CRUSHERS

there are over 3,000 Champion Machines in use. Every machine is speaking for us by the good work it is doing.

Champion Crushers are made of steel. They work well and last well. We offer them as the best and most economical crushers made.

Five different sizes, from 75 to 300 tons daily capacity. Elevators, screens, conveyors, engines, boilers. Complete plants installed.

HANDSOME CATALOGUE FREE ON APPLICATION

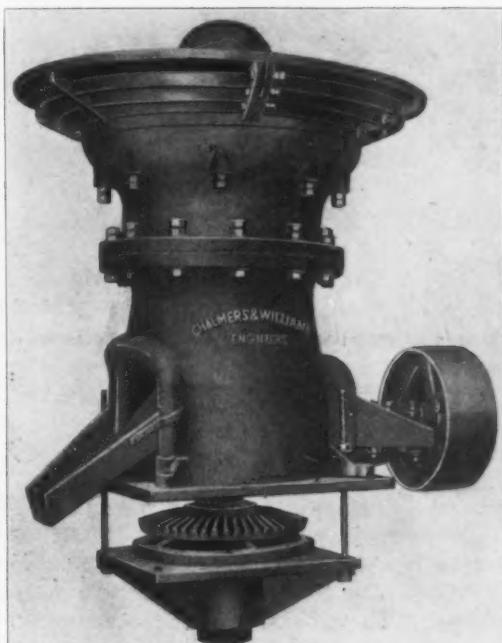
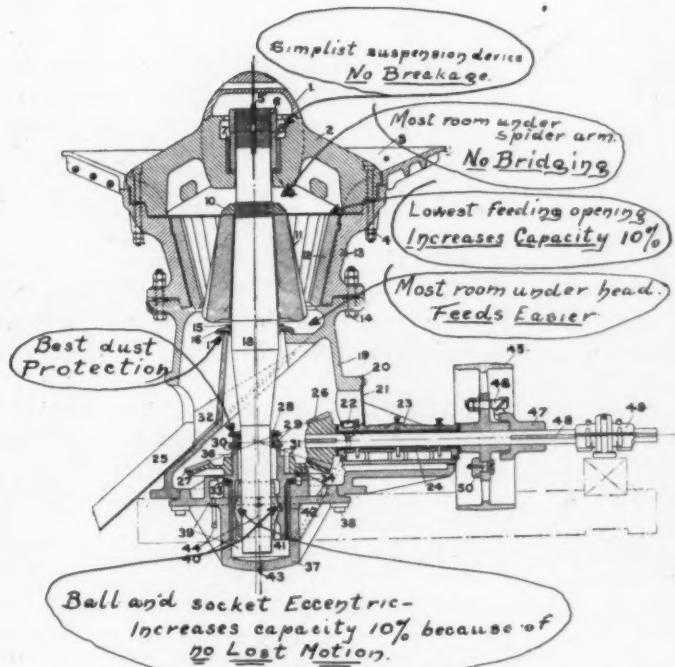
The Good Roads Machinery Co.
KENNETT SQUARE, PA.

KENNEDY CRUSHER

MANUFACTURED BY

Chalmers & Williams Co.

MOST UP-TO-DATE GYRATORY CRUSHER



Made in all sizes from No. 2 (opening 7 in. x 52 in.) to No. 12 (opening 36 in. x 261 in.). Designing complete plants a specialty.

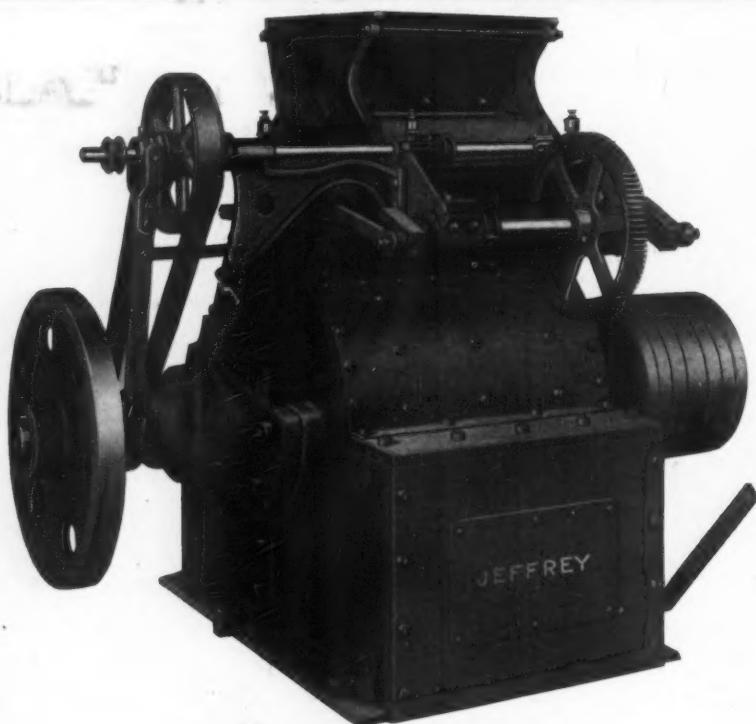
Write us for catalogue.

See our exhibit at the Cement Show—Booths 51, 52, 53
Main Building—218, 219 Annex

Marsh-Capron Mfg. Co.

GENERAL AGENTS

990 Old Colony Bldg., Chicago



EQUIPPED WITH AUTOMATIC PLATE FEEDER

IN A CLASS BY
ITSELF

The Jeffrey Type "B" Pulverizer

(SWING HAMMER)

IS A LONG STEP IN ADVANCE OF
ANY OTHER MACHINE MADE for
REDUCING CEMENT LIMESTONE

Some Good Reasons Why

It is provided with an ADJUSTABLE BREAKER PLATE, made of Chilled White Iron or Manganese Steel, which is adjusted with a bar wrench to compensate wear on the hammers. This permits a uniform product to be always maintained and overcomes a serious objection to other pulverizers of this type.

The screen bars are made of Tool Steel and the hammers are of Tool Steel or Manganese Steel. The machine is designed in such a manner that the material is broken in suspensions so thoroughly that the bottom bars are only required to screen the product.

When desired, the pulverizer is equipped with an Automatic Plate Feeder which delivers the material at a uniform rate and distributes it to all the hammers so that none are overloaded and none are idle.

Any refractory foreign substance, accidentally fed with the material, may be easily removed through the Drop Bottom Cage without stopping the machine.

Ring Oiling, Ball and Socket, Bronze Bushed Bearings, of the highest type used in heavy dynamo service, are employed. These, our experience has shown to be the most serviceable and to substantially reduce the consumption of power.

It is designed and built throughout in an effort to produce the most efficient and dependable machine possible, regardless of cost. It has a larger capacity, yields a more uniformly fine product, consumes from 20 to 30 per cent less horse power per ton of capacity, and costs less for upkeep than any other machine of its kind.

We do not claim that it costs less than any other machine, but we do claim that, from every standpoint, it is absolutely the best limestone pulverizer made.

Crushing tests of materials sent in are made without charge, and in such cases our quotations are accompanied by definite guarantees based upon the results obtained.

The Jeffrey Manufacturing Co.
COLUMBUS, OHIO, U. S. A.

BRANCHES:

NEW YORK

BOSTON

PITTSBURG

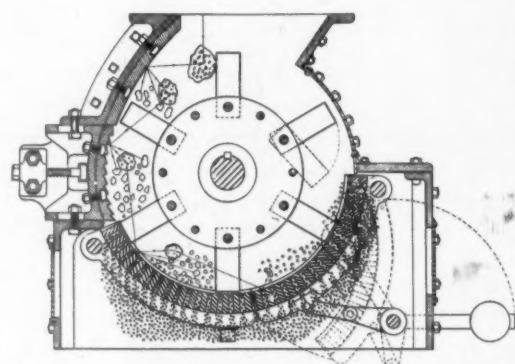
CHICAGO

ST. LOUIS

DENVER

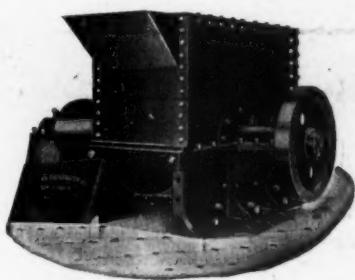
KNOXVILLE

CANADIAN OFFICE AND WORKS: MONTREAL



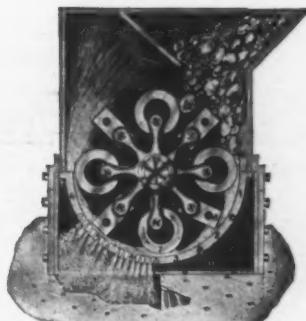
Side view of section of machine without fender, showing corrugated adjustable breaker plate, drop bottom cage and renewable chilled liners.

AMERICAN RING-HAMMER PULVERIZER



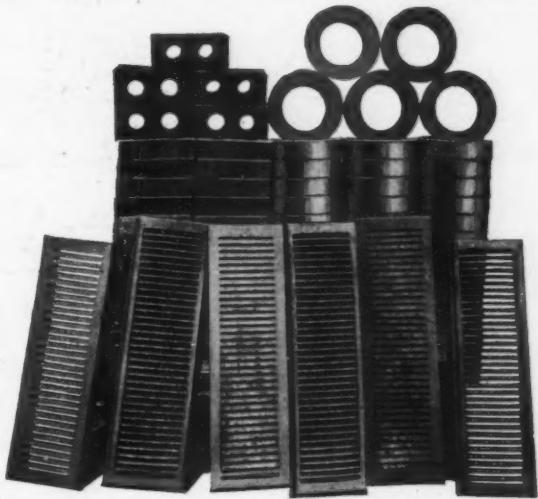
SHALE PULVERIZER
Made in Six Sizes

GUARANTEED



Shows How It's Done]

GREATEST STRENGTH—GREATEST WEAR



MANGANESE STEEL

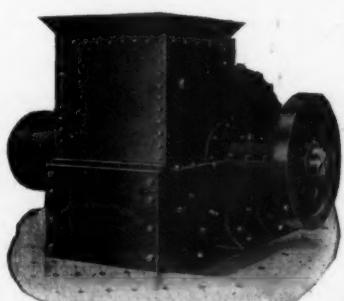
RINGS, HAMMERS AND GRATE BARS
ANY WIDTH OPENINGS IN GRATE BARS

CRUSHES AND PULVERIZES
Limestone, Cement, Clinker, Etc.

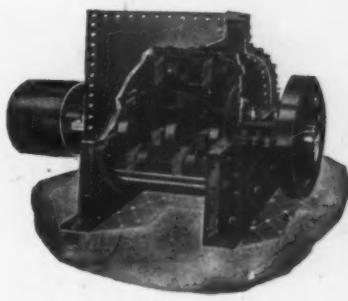
30 DAYS
ACTUAL OPERATING TEST AT YOUR WORKS

SEND FOR CIRCULARS

Manufactured by the



ROCK PULVERIZER—Made in six Sizes



Shows Why It's Done

American Pulverizer Company

Suite 410 Mermod-Jaccard Building
ST. LOUIS, MO.

Tell 'em you saw it in ROCK PRODUCTS

SAND LIME OR SILICATE BRICK



This plant located at South River, N. J., was formerly intended to operate under the "Division System," but is now being reconstructed to conform in every detail to the Wiebe-Hydro-Lime-Silicate-Process, and will be when completed the largest plant in the United States with a daily capacity of 100,000 brick.

SAND DRYER

High efficiency and durability

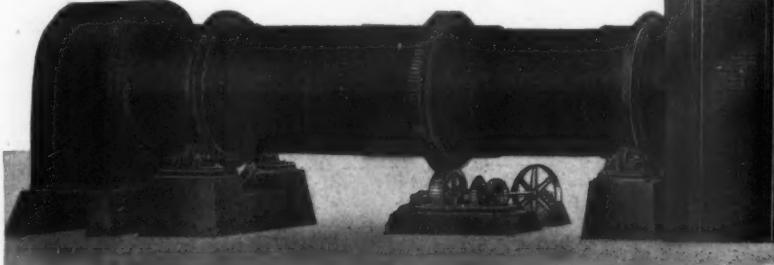
RESUME

Dating as far back as 1901, when the manufacturing of commercial silicate brick was introduced into this country, no system has been more successful than the so called "Silo" or "Division" method.

In the ratio that the Silo or Division Process is superior to all other systems hitherto employed, in that proportion the Wiebe-Hydro-Lime-Silicate process is superior to the Division methods.

All other processes are commercial impossibilities, and those who are operating under these old methods are losing money and producing an inferior quality of brick.

Will dry your sand perfectly and still deliver it at the discharge end at a very low temperature. At the point where the material contains the most moisture it strikes the hottest fire, and the moisture is immediately drawn away from the material being dried.



WIEBE ENGINEERING COMPANY

- - - 170 Broadway, NEW YORK

The Chase Roller Bearing Car FOR CEMENT, BLOCK AND TILE



BOTTOM AND SIDE DUMP CARS, TRANSFER CARS, TURNTABLES, SWITCHES, ETC.

You cannot afford to overlook the necessity of handling your material and product as economically as your competitor. Our goods will help you do this.

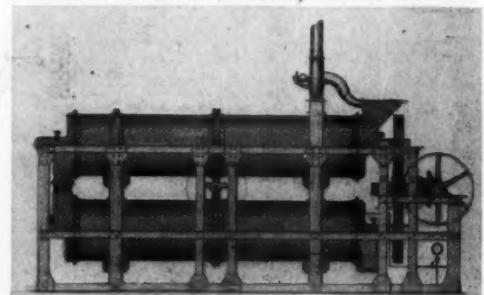
WRITE US FOR CATALOG AND PRICES

Chase Foundry Manufacturing Co.
COLUMBUS, OHIO

Tell 'em you saw it in ROCK PRODUCTS

MANUFACTURED under the Wiebe Hydro-Lime-Silicate-Process, and by our specially designed machinery, have been acknowledged by leading engineers, architects and organizations of New York City to be the most perfect sand brick in the country. Compression as well as transverse strength, and its non-absorptive qualities far exceed the requirements of the city.

BY THE INTRODUCTION of our process and special machinery in this country, a large and profitable field is thrown open to the American manufacturer engaged in this industry. The product from same is perfect, beautiful, and unexcelled.



Hydro-Vapor Preparation Machine

Eliminates your doubts and worries. No sand-lime-brick plant is complete or successful without this machine. Receiving the material from the Silo, it prepares and delivers same in an absolutely perfect condition for the press.

Do you wish to know WHY our process is superior to all others? If you have any experience in the production of silicate brick and will allow us to show you the merits of our process, you can easily understand why, and you will then readily appreciate the merits thereof. If you are interested we will gladly enter into any detail necessary to demonstrate the superiority of our system over all others.

Engineers, Designers, Builders of Factories for the Manufacture of High Grade Silicate Brick, Colored and Fancy Brick, Roofing and Wall Tile.

Sole Owners of The Wiebe Hydro-Lime-Silicate-Process and Special Patented Machinery.

STUDY TROY DUMP WAGONS

A comparison or contrast with any other will demonstrate their simplicity and superior merits. They are scientifically designed, correctly built, strong, light running, and last for years. Their winding, locking and dumping mechanisms are most effective and reliable; their neverwearout overlapping reinforced steel bottom doors prevent leakage and do not split, swell, or shrink; their springs over rear axles relieve strain and add to their long life; and they have many other points that appeal to discerning users.



Dump wagons should be carefully studied before a purchase is made, and the best time to begin is not just a few days before they are required, but long enough in advance to get an understanding of them. Commence now by sending for our catalog No. 2-P which gives many facts worth knowing about the most efficient bottom-dump wagons.

THE TROY WAGON WORKS CO.
101 East Race St., TROY, OHIO

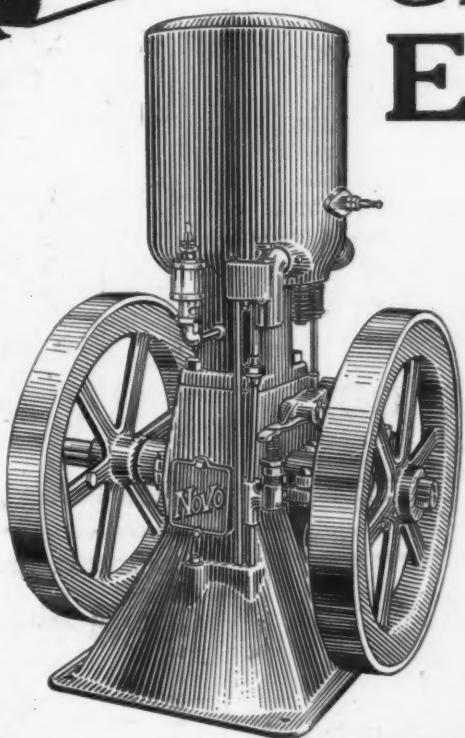
ONE of the severest tests to which an engine can be put is running a cement or concrete mixer. Novo Gasoline Engines are unequalled for this heavy and trying sort of work because of their peculiar construction. The uneven feeding of the mixing machine and the consequent demand for power has little effect on the even running of the Novo.

The Novo Engine will run down in speed when overloaded but it will not stop and it quickly picks up to normal speed.

There are many other reasons why this engine is best fitted for the work of cement or concrete mixing.

NOVO

GASOLINE ENGINE



The Novo Gasoline Engine is a **self contained** power plant, all easily moved at once, and quickly set up and started working anywhere. No piping, tank, or fittings are required and there are no delicate or complicated parts.

The Novo is water cooled but guaranteed to be proof against damage by freezing and we will replace any cylinder or jacket cracked or broken on account of frost.

NEVER BALKS AT A SUDDEN DEMAND FOR POWER

We want you to know more about this practical, strong, durable engine. Send for the Novo Engine Booklet and Quotations—It's full of Engine information and FREE.

HILDRETH MFG. CO.

101 Williams Street
LANSING, MICHIGAN

The "Piqua" ALL STEEL QUARRY TRUCKS

Are always close to the ledge, and do away with expensive systems of tracks, and the cost of moving them.

Quarrymen will do well to investigate this new means of reducing cost.

Equally adapted for hand or steam shovel loading.
Send for Catalog.



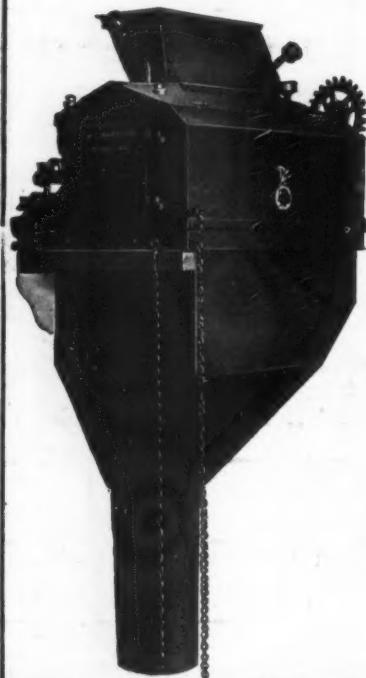
Practical

Strong

Durable

The Statler Stone Company, Box 516 Piqua, Ohio

Automatic Cement Bagging



The Richardson Automatic Bagger weighs 5 to 6 bags of Cement per minute with a guaranteed accuracy of within one-half pound per bag.

**Simple,
Practically Dustless.**

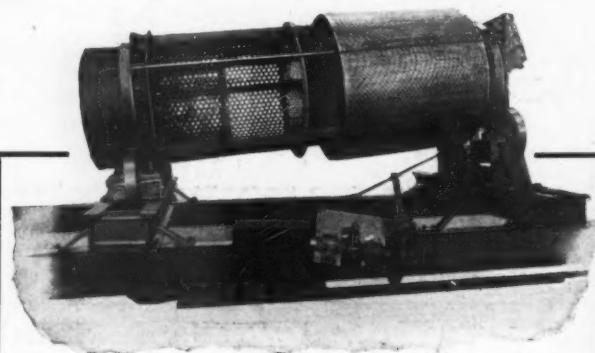
No expense beyond initial outlay.

With this machine you don't give away cement in overweights, nor get complaints from contractors for short weights.

Average weight put in bag, exactly 95 lbs.

RICHARDSON SCALE CO.,

7-8 Park Row, NEW YORK,
122 Monroe St., CHICAGO.



SCREENS

The mechanical features of TISCO screens are such that a minimum of power is required to operate them.

All wearing parts being of TISCO MANGANESE STEEL insures long wear and a maximum of service at a minimum cost, unapproached for sizing broken stone, ore, coal, etc.

CATALOG?

TAYLOR IRON & STEEL CO.

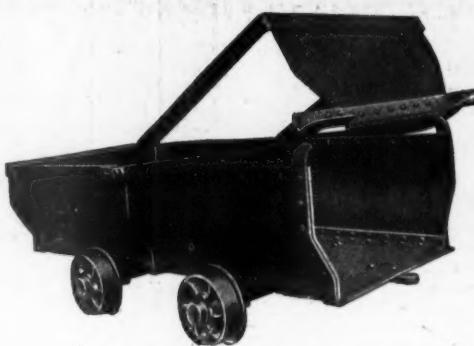
HIGH BRIDGE
NEW JERSEY

Tell 'em you saw it in ROCK PRODUCTS

→IN STOCK!!← **5-1½ YD. QUARRY CARS**

For immediate shipment similar to cut below

**36"
G A U G E**



**14"
W H E E L S**

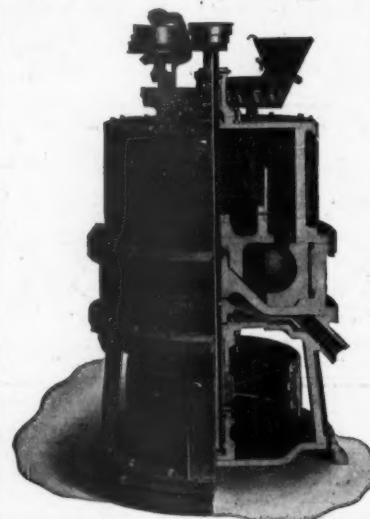
These Cars are new all steel, equipped with self-oiling wheels and wood sub sill bumpers. Height 34" top of rail to top of car.

See catalogue No. 31-R for other types.

H. B. Sackett Screen & Chute Co.

4212 State St., Chicago, Ill.

The Fuller-Lehigh Pulverizer Mill



[Cement Companies equipped with Fuller Mills advertise the fact that the consumer gets 38 pounds more of the IMPALPABLE POWDER or REAL CEMENT in every barrel of cement produced by The Fuller Mill than by any other

Produces Commercially

Cement having a higher percentage of Impalpable Powder than can be obtained by any other mill. Tests show that the tensile strength of a 1-5 mortar made with cement pulverized by the Fuller Mill is higher than the tensile strength of a 1-3 mortar made with cement pulverized to the fineness required by the Standard Specifications.

Lehigh Car, Wheel & Axle Works

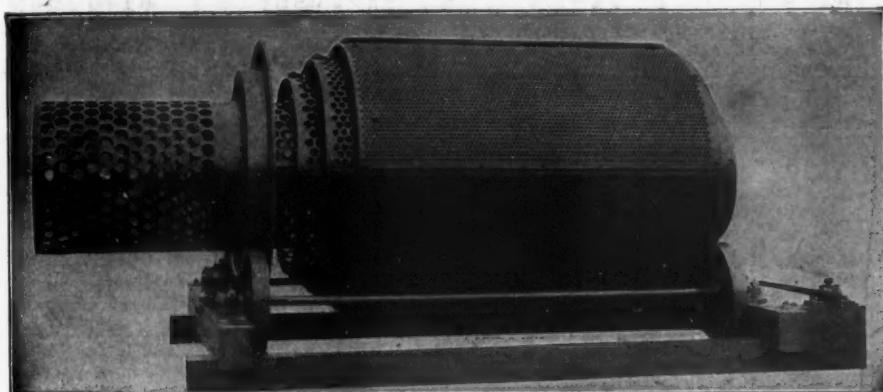
Main Office: CATASAUQUA, PA.

New York, N. Y.

Kansas City, Mo.

Hamburg, Germany, Alsterdamm 7.

JOHN O'LAUGHLIN'S SCREEN



The advantages of these screens are described in detail in a circular which WE WILL MAIL TO ANY ADDRESS. Mr. John O'Laughlin, the inventor, has designed many notable improvements in rock-drilling, quarrying, crushing and screening machinery, and uses these improved screens in his own crushing plants, which others have declared "to be the most perfect in existence in every detail." The O'Laughlin Screen is an important factor in the most modern and perfect stone-crushing plant.

made solely by Johnston & Chapman, is the

ONLY SCREEN

on the market for wide-awake quarry-men and miners, who want to separate crushed granite, limestone or other minerals, gravel, sand, coal or coke. It will soon earn its cost in saving of repairs, and maintenance, and reduced power, and will do more and cleaner work than any other cylindrical screen of like area. No one can afford to keep old traps in use when the O'Laughlin installed

NOW

will from the moment it starts give a better and larger product, and a big interest on your investment in continuous saving in cost of repairs, renewals, and power. For particulars, address:

JOHNSTON & CHAPMAN CO.

Corner Francisco and Carroll Ave., Chicago, Ill.

Perforators of Sheet Metals, Flat, Cylindrical, and Conical Perforated Screen Plates for Quarries, Mines, Reduction Works, Mills and all Industrial Purposes.

NEWAYGO SCREEN

SCREENS

From One-Quarter inch to 200 Mesh

PRICE \$285.00

Sold on Trial

If not perfectly satisfactory
in every way, it can be

Returned

Hundreds in operation—A few users and
number of Newaygo Screens bought:

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Richmond Chemical Works	2	International Freight Bureau	9	Helderberg Cement Co.	1	Southern California Cement Co.	1	F. S. Rovster Guano Co.	6
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Anti-Kalsomine Co.	2	Alabama Chemical Co.	2	Stuart-Beebe Co.	7	W. J. McCalan Sugar Refining Co.	2	Barker Chemical Co.	6
Alpena Portland Cement Co.	3	Thomas C. Fawcett, Ltd.	12	Carnegie Steel Co.	8	International Salt Co.	8	American Trading Co.	4
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STURTEVANT MILL CO., 110 Clayton St., Boston, Mass.

Tell 'em you saw it in ROCK PRODUCTS



"LITTLE GIANT" LOADING BLASTED ROCK.
Diamond Portland Cement Co., Middlebranch, O.

Giant Boom Shovels, six sizes, 1½ to 5 cubic yard dippers. **Little Giant Shovels**, two sizes, 1 ¼ cubic yard dippers. **Revolving Shovels**, three sizes, ¾ to 1½ cubic yard dippers. **Steam or Electric Power**. **Traction Wheels or Railroad Trucks**. Send today for booklets.

VULCAN

Steam and Electric Shovels

are the best that money can buy because they are correctly designed and substantially built. Every part is made of material which we know from our thirty years' experience in high class steam shovel building to be the best for the purpose. Before shipment each shovel is set up complete in our yards, thoroughly tested under full steam and all parts carefully inspected and adjusted. You are invited to witness this test and the shovel isn't shipped until both of us are satisfied that it is right in every respect. In addition to this, we give you the benefit of a 10 day trial test in your own quarry and you don't have to accept the shovel until we have demonstrated on your own work that it is just as represented. Every shovel we build is covered with an iron clad guarantee to give complete satisfaction. Write us today, giving a description of your material and the amount you wish to handle per 10 hours and we will promptly send full information, specifications, prices, etc., of a shovel which we will guarantee to do your work satisfactorily.

THE VULCAN STEAM SHOVEL CO.
Toledo, Ohio

NEW YORK OFFICE: 45 Broadway,
Telephone 4039 Rector

DENVER OFFICE
305 Appel Bldg.

CHICAGO OFFICE: 1301-2-3 Great Northern
Bldg.; Telephone Harrison 2838



95-C IN SANDUSKY PORTLAND CEMENT COMPANY'S QUARRY.

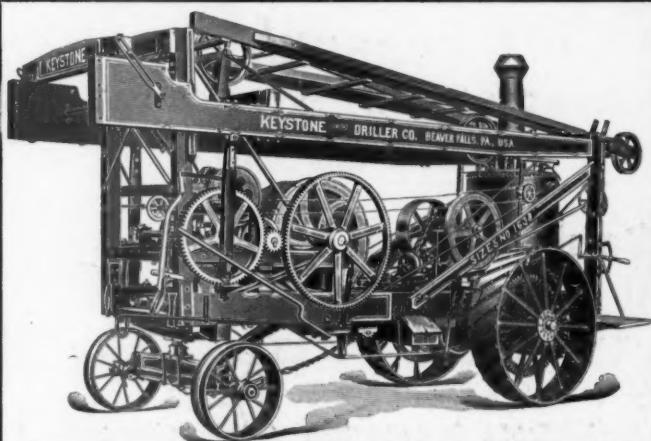
Bucyrus Shovels Are Loading Crushed Stone and Digging Blasted or Unblasted Cement Rock in the Leading Quarries in the United States.

THE BUCYRUS CO.

Branch Offices
NEW YORK
SAN FRANCISCO

Main Office & Works:
South Milwaukee, Wis.

KEYSTONE CHURN DRILLS FOR HEAVY BLAST HOLES



IN CEMENT and STONE QUARRIES, where large and deep blast holes can be used to advantage, these machines form the cheapest and quickest means of sinking 6 inch holes.

Penetrate any formations, any depth, 30 or 300 feet. Self-moving or portable, if desired.

Ask for Catalog No. 4.

KEYSTONE TRACTION DRILL CO.
Monadnock Bldg., BEAVER FALLS, PA., CARTHAGE,
CHICAGO. 170 Broadway, NEW YORK. MISSOURI.

WE CAN SAVE YOU MONEY, TIME AND TROUBLE

WE KNOW IT—BUT LET US PROVE IT TO YOU



CEMENT TRADE.

GREASE

Is not affected by climatic conditions. Will not run off the bearings. This is a perfect lubricant and is fire-proof and will absolutely keep bearings cool under the most extreme conditions.

CRUSHED ROCK PRODUCERS.

CRUSHER COMPOUND

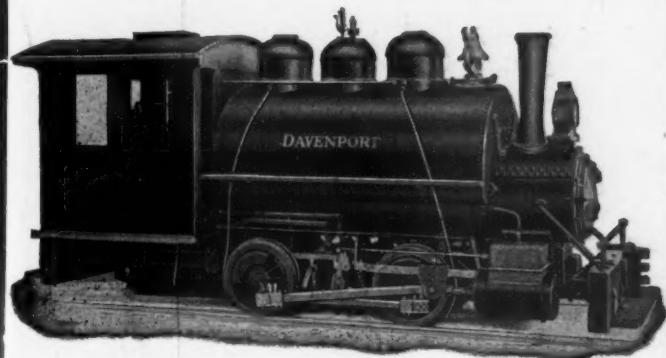
This compound is a heavy oil which has the same properties as the grease. It is fire-proof and is not affected by hot weather. Will not run off bearings and will absolutely keep them cool. This is for crushers and machinery using pump system of lubrication.

**ORDER A BARREL AT ONCE TO BE PAID FOR IF SATISFACTORY
WE TAKE THE RISK AND PAY THE FREIGHT**

155-161 North Ada St., Chicago, Ill.

New York Office, 25 Broad St., New York City

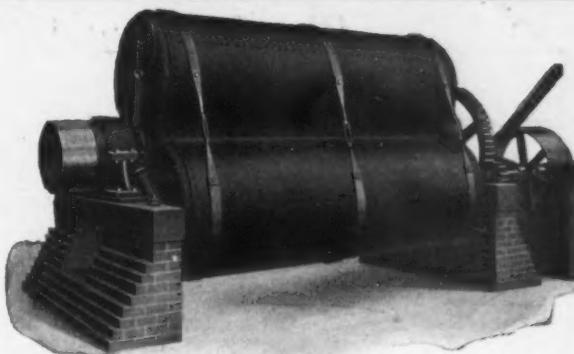
Do You Have Cars to Haul?
The Davenport Locomotive
Will Save Money



Special Designs for Special Purposes
Any Size, Any Gauge, Any Weight
Write for Prices and Particulars

DAVENPORT LOCOMOTIVE WORKS
DAVENPORT, IOWA

Sent on Approval



U. S. Patent Aug. 13, 1907

WE will install our Multiple Tube Mill for any reliable concern on approval.

We are willing to do this to prove that our mill is the most economical pulverizing device in existence. We claim superiority over the ordinary tub mill in that the construction is different and an enormous amount of power is saved. The load is distributed equally around the center, about which it revolves while in operation.

Write for Bulletin

J. R. Alsing Engineering Co.
134 Liberty St. New York, U. S. A.

Powdered Materials Handled by Blast

for any purpose desired, by Osborne Pneumatic Systems. Cement, phosphate, lime, graphite and all other pulverulent products may be taken up, separated, graded and delivered at any number of points. Great capacity and small power consumption.

Write now for our new catalogue giving illustrations of many applications of the systems.

Will send also catalogue of Reilly Multicoil Feed Water Heater if you want it.

The Griscom-Spencer Co.

90 West Street, New York

For Grinding Limestone

We Guarantee that

One Raymond Mill with Air Separator

will deliver at point of storage

3½ Tons per hour---98%, 200 mesh.

Think what that means. Compare it with the capacity of other mills. The nearest approach to this capacity that we find claimed by other mills is

2½ Tons per hour.

and that is merely for the actual grinding in the mill. It does not include separating or delivery of the finished product to point of storage, which must be accomplished by additional expensive machinery which is entirely eliminated in the Raymond System. The Raymond System does it all.

Furthermore, 3½ tons per hour is our conservative guarantee. As a matter of fact, where the material is favorable, the Raymond System can deliver and is actually delivering, a finished product at the rate of

6½ Tons per hour---92%, 200 mesh.

We can demonstrate to any cement manufacturer that he is losing money if he is not using the Raymond System for grinding his raw material and coal. This is a big statement and we make it with a full realization of its gravity and importance to the Cement Industry. We can "make good" on this statement. Do you want us to "show you?"

Raymond Brothers Impact Pulverizer Co.

141 Laflin Street, Chicago

Hydrated Lime

Bulletin No. 34

When small per cents of hydrated lime are added to concrete it is an advantage in a number of ways:

- (1) The concrete works easier under the trowel.
It finishes easier.
- (2) It prevents drying out as quickly as it otherwise does.
- (3) It improves the color of the finished work.
- (4) It makes the concrete more impervious to water.
- (5) It improves the strength.

(1) Hydrated Lime is very fine. Its fineness exceeds that of the finest Cement by 9-10 per cent, that is, 94 per cent will pass 200 mesh, while the finest Cement placed on the market has a fineness through 200 mesh of 85 per cent. Hydrated Lime is 19-20 per cent finer than standard ground Cement, which have 75-76 per cent through 200 mesh sieve.

When small per cents, say 10 per cent, is added and well mixed the finely divided, flaky nature of the Hydrate reaches every part of the mass. On account of its lightness it follows the tendency of the moisture to work to the surface. In so doing the granular particles becomes coated with thin film of Hydrate and the mass offers less resistance to the workman's tools. Mixing is therefore easier. When the finish coat is put on the same is true and by the time this is well worked in place there is sufficient Hydrate present at surface to make floating and troweling easier. The finisher can do this important work much faster and easier.

(2) There is a tendency of concrete to dry out. This is true while it is being mixed and while it is in early stage of hardening. Drying out varies, but even in cold weather when a gentle breeze is stirring it goes on to some extent. In hot weather or windy weather it is greatest. To prevent this, work is protected or more water is used. It is also sprinkled after it begins to harden. Hydrated Lime, when added, prevents drying out. It has a tendency to hold the moisture in the mass.

(3) Hydrated Lime makes the color lighter. When work is well done and well finished the color should be a light gray. Through ingenious workmanship some very pleasing finishes are produced. Take any case, work is lightened in color several shades by addition of 10 per cent. It approaches white, the color desired in all finish work. Hydrated Lime overcomes any other color in the sand. In some localities sand is dark, sometimes a reddish color.

(4) The base of most water proof compounds is Hydrated Lime. The solubility of Hydrated Lime is 50-65 per cent greater than Cement. This heavily saturated solution in concrete crystallizes in the voids of concrete. It fills the spaces there as much as possible and makes the mass more dense. Cement has a tendency to do the same, but not sufficient in general work, to make the mass impervious to water.

(5) The all important result in concrete work is strength. When strength is increased by an improvement it is a success. Hydrated Lime when added in amounts of 5 to 10 per cent does improve strength.

Our business is the designing and constructing of Hydrating plants. To make this up-to-date material, we have the only process that has proved successful in hydrating a High Calcium and Dolomite limes.

It requires about four months to build a plant, why not take this matter up with us now and get ready for next season's business.

The Kritzer Company
115 Adams Street, - CHICAGO, ILLINOIS



The Clyde Hydrator

is the accepted standard of highest efficiency, economical operation, positive results and general all around serviceability in hydrating machinery.

There are more of them in use than all others put together.

They have proven their merit under all conditions.

We will furnish full information, booklets and interesting data on your request.

"We like to answer questions"

CLYDE IRON WORKS

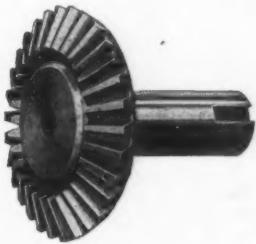
Manufacturers.

DULUTH, MINN.

Tell 'em you saw it in ROCK PRODUCTS

Make Money

by adopting Nuttall cut or planed gears as your standard. You will be surprised at the reduction in your repair bills.

**Nuttall—Pittsburg**

When in a hurry, wire us.

THE FULLER ENGINEERING CO.
DESIGNING, CONSTRUCTING AND OPERATING
ENGINEERS ANALYTICAL CHEMISTS
CEMENT MILLS A SPECIALTY
OFFICES: ALLENTOWN NAT. BANK BLDG. ALLENTOWN, PA.

MACHINERY

FOR
Industrial Plants



We manufacture machinery for transmitting power, and for elevating and conveying materials in and about cement plants, rock crushing plants, lime plants, mortar works, plaster works, and other industries.

We manufacture screw conveyors, belt conveyors, and all sorts of chain and cable conveyors, for handling rock, lime, sand, etc.

We manufacture elevators, also, for handling the same kinds of material. Our lines include shafting, couplings, bearings, collars, pulleys, gears, rope sheaves, sprocket wheels, elevator buckets and bolts, steel elevator casings, etc.

We have our own foundry, sheet metal department and machine shop. We employ first-class help in all departments and use high-grade materials.

When you are in need of anything in our line, try us.

Catalog No. 34

H. W. Caldwell & Son Co.

17th St. and Western Ave., Chicago

Fulton Bldg., Hudson Terminal, No. 50 Church St.
NEW YORK CITY

**WATER AND GANDY**

ing the lower portion of the belt: at such times it is necessary for us to pump the water out of the pit before starting up in the morning and wipe the belt off with a piece of waste and start up.

This belt has been running for several years, and working under the unfavorable conditions it does, we have no fault to find with it.

(Signed) F. A. Lazenby, Pres. Yours respectfully,

BALTIMORE MACHINE & ELEVATOR WORKS.

There are letters telling about the success of the Gandy Belt under all conditions in our booklet, "Experiences with Gandy." Tear this Ad out and write for it today.

THE GANDY BELTING CO., Baltimore, Md.

New York Office, 88-90 Reade St.

Wade Iron Sanitary Mfg. Co.

MANUFACTURER OF

Wade Back Water Gate Valves, Clean-Out House Drainage Fittings, Iron Catch Basins and Cast Iron Covers, Etc.

Send for Catalogue.

Long Distance Phone, Harrison 6713.

43 E. Harrison Street, CHICAGO, ILLS.

CLINTON METALLIC PAINT CO.

CLINTON, N. Y.

LARGEST AND OLDEST MANUFACTURERS OF

BRICK AND COLORING

Be sure you get the genuine with the "Little Yellow Side-Label" on each package.

Let us tell you about Side-Wall Black.



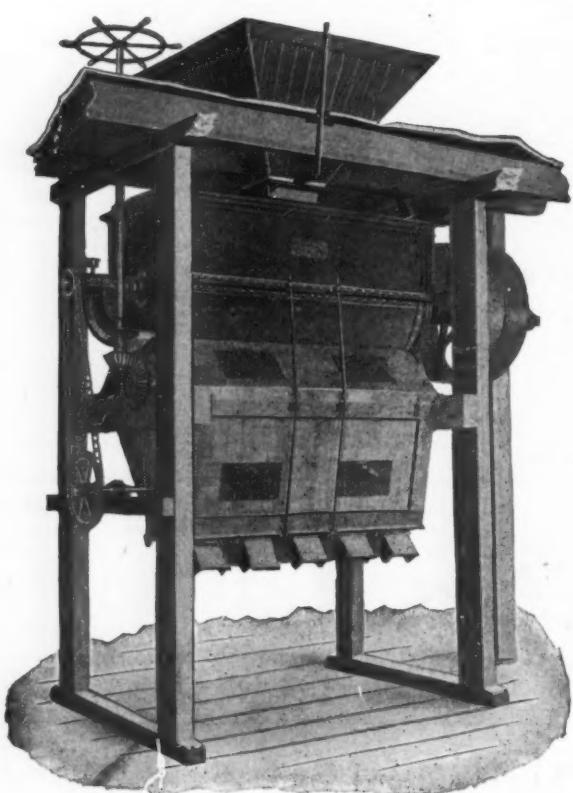
Osborne Crushing Plant of the Springfield Coal & Ice Co.

We are prepared to ship crushed limestone from $\frac{1}{2}$ to $3\frac{1}{2}$ inches on short notice.

On account of the high percentage (96 to 98%) carbonate of calcium, this material is especially suited for fluxing.

Excellent Shipping Facilities and Prompt Service.

The Springfield Coal & Ice Co.
SPRINGFIELD, O.



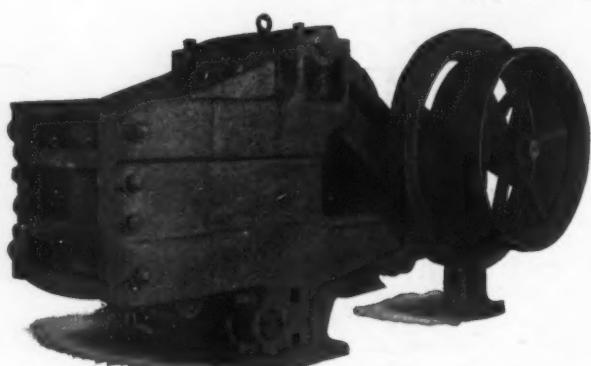
ENTERPRISE PLASTER MIXER

**NOISELESS,
DURABLE and EFFICIENT.**

For Mixing Hair Fibre, Wood Fibre and
Retarder with Dry Plastering
Materials.

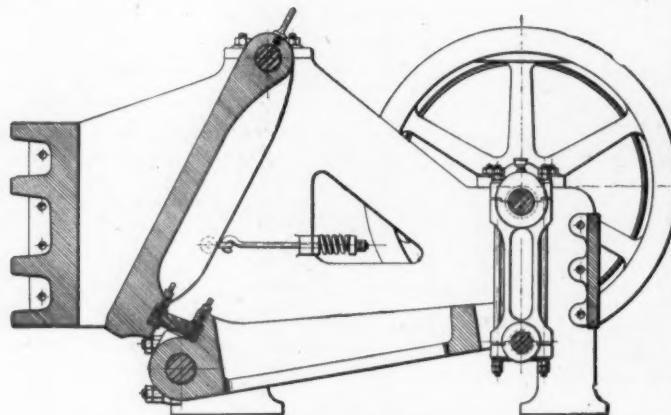
Calcining Kettles

Jaw and Rotary Crushers for Gypsum, Reels,
Vibratory Screens, Hair Pickers and Trans-
mission for applying power.



EHRSAM NO. 4 JAW CRUSHER.

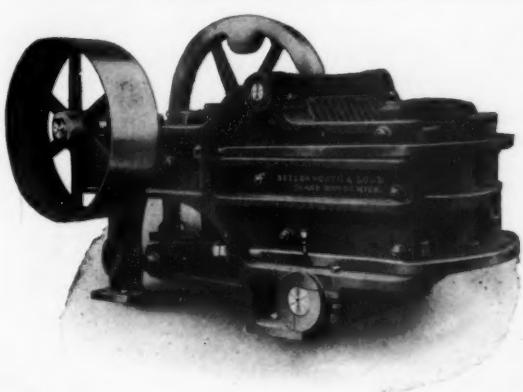
This machine will handle large chunks and reduce from 30 to 40 tons of Gypsum per hour to 2½-inch maximum or smaller if wanted.



NO. 4 JAW CRUSHER, SHOWING SECTIONAL VIEW OF NIPPER.
The jaw opening at inlet is 18x28 inches.

The J. B. Ehrsam & Sons Mfg. Co.,
BUILDERS OF
COMPLETE EQUIPMENTS FOR PLASTER MILLS
Enterprise, Kansas

Tell 'em you saw it in ROCK PRODUCTS



CRUSHERS

for soft rocks, burnt lime, etc.

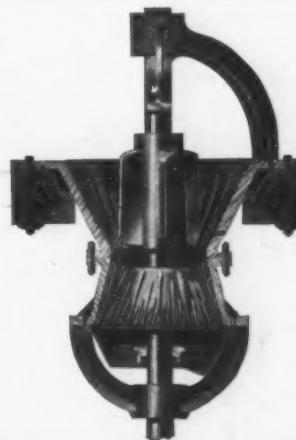
GYPSUM MACHINERY

We design modern Plaster Mills and make all necessary Machinery, including Kettles, Nippers, Crackers, Buhrs, Screens, Elevators, Shafting, etc.

SPECIAL CRUSHER-GRINDERS FOR LIME HYDRATORS

BUTTERWORTH & LOWE

17 Huron Street, GRAND RAPIDS, MICH.



GET THE BEST

Finest Line of Gypsum Machinery

MADE

KETTLE CRUSHER NIPPERS

ASK FOR CATALOG OF

MOGUL NIPPERS. OPEN DOOR POT CRUSHERS

Best Mills in the United States Have Them

McDONNELL BOILER & IRON WORKS, Des Moines, Iowa, U. S. A.

"Formerly Des Moines Mfg. & Supply Co."

SPECIAL MACHINERY AND FORMULAS

FOR THE MANUFACTURE OF

WOOD FIBRE PLASTER, FIRE PROOFING
AND KINDRED PRODUCTS

We furnish the latest improved FIBRE MACHINE, (fully patented) also FORMULAS, on a reasonable proposition. The strongest companies and oldest manufacturers are operating under my contracts.
WRITE FOR TERRITORY

The Ohio Fibre Machinery Co.

J. W. VOGLESONG,
GENERAL MANAGER

Elyria, Ohio

KING'S WINDSOR CEMENT
FOR PLASTERING WALLS AND CEILINGS

Buffalo Branch, CHAS. C. CALKINS, Manager
322 W. Genessee Street

Elastic in its nature, can be applied with 25 per cent less labor and has 12½ per cent more covering capacity than any other similar material

J. B. KING & CO., No. 1 Broadway, New York

SEE IT
AT CEMENT
SHOW
BOOTH No. 12

Write for Samples and
Particulars

Do You Know?

Beaver Board

Makes the Best Covering for Concrete
Walls and Ceilings or any other
Kind of Walls and Ceilings

WISCONSIN
LIME &
CEMENT CO.

Selling Agents and
Distributors for Central States
607 Chamber of Commerce
Chicago, Ill.

Tell 'em you saw it in ROCK PRODUCTS

in the Lime Light "Universal"

In the "lime" light of experience—i. e.—in the light of lime experience, the careful builder of the present will eschew all suggestion of familiar lime troubles by building his plastered walls with modern hard plasters and particularly by finishing with

UNIVERSAL

The Finish Without Lime

No plastered wall is as good as it might be, which is not builded with U. S. G. Hard Plasters and finished with "Universal."

No Architect who desires to maintain a distinguished place and prestige in his profession, can afford to neglect specifying "Universal" for the final plaster coat—particularly in the better class of residences and buildings.

No Contractor who values the net economy of a good job well done, can afford to disregard the specification of "Universal."

No Builder who wants things right, will jeopardize the life and beauty of his expensive mural decorations, by not insisting on an "Universal" finish—when he knows about it, and the majority of good builders do.

No Material Dealer Can Afford

not to carry and actively push "Universal"—if he be building his business for the future—if he value the reputation of being modern and alert—if he desire to hold old customers and create new business with new commodities—if he desire to eliminate stock shrinkage and make more money with less labor and expense on finishing materials.

We Help The Dealer Sell "Universal"

by supplying him generously with the snappiest, brightest kind of instructive and convincing Advertising Matter—a class of Advertising Literature such as will do him credit, when put into the hands of the most select home owners, bearing his own advertisement.

For instance—Write us Today for copy of the little "Universal" Booklet, "Here's Your Finish." Do this—it's good money in your pocket. Address our nearest office.

United States Gypsum Company

NEW YORK

CLEVELAND

CHICAGO

MINNEAPOLIS

SAN FRANCISCO

Stucco Retarder

Strong
Uniform
Fine Ground } RETARDER

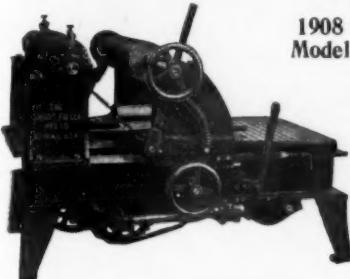
We are the oldest Retarder firm
in the United States, and above
is our motto. New fire-proof
plant and prompt service.

FREE SAMPLE ON REQUEST

Chemical Stucco Retarder Co.
WEBSTER CITY, IOWA.

INCORPORATED 1895

The Shuart-Fuller Improved Fiber Machine



1908
Model

Has an automatic, proportional, increasing feed, which keeps grade of fiber uniform from start to finish, and holds machine to highest possible rate of production for the grade of fiber and number of saws. Does not begin with fiber and end with dust, nor fall off in rate of production on each log, from 40 to 80 per cent as do the ordinary non-increasing feed machines. Works logs up to 24x24 inches. No royalty string attached to sale. Pay no attention to misrepresentations of our competitors, but write for descriptive circular and terms to

The Shuart-Fuller Mfg. Co.
ELYRIA, OHIO

St. Louis, June 17, 1907.
Gentlemen:—We are just in receipt of advice from our New Mexico plant wherein they state that the Wood Fiber Machine recently shipped by you is doing all that we have asked of it and running very fine

ACME CEMENT PLASTER CO.

By Jas. R. Dougan, Sec.

THE SHUART-FULLER CO., Elyria, Ohio.

Gentlemen:—We are just in receipt of advice from our New Mexico plant wherein they state that the Wood Fiber Machine recently shipped by you is doing all that we have asked of it and running very fine

The Combined Gutter and Curb Finisher No Expert Required

Patented October 18, 1904

With this tool there is scarcely any limit to the amount of curb and gutter that one man can finish in a day. Its operation can be learned in an hour's time.

The Finishing has always been one of the most expensive items in connection with this work.

With our "Former" more work can be done at much less expense, in fact for less than one half the usual cost.

For full particulars, address

CARLON CONSTRUCTION CO.
Oskaloosa, Iowa

Tell 'em you saw it in ROCK PRODUCTS

**CUMMER CONTINUOUS PROCESS
FOR
CALCINING
GYPSUM**

NO KETTLES
USED

PLANTS IN
OPERATION

Great Saving in Cost of Manufacture and Quality of
Product Guaranteed.

The F. D. CUMMER & SON CO., Cleveland, O.

Plaster! Plaster!

Iowa Hard Plaster Co.

HARD BY NAME. HARD BY NATURE.
HARD TO BEAT. NOT HARD TO GET.

Iowa Hard Plaster Co. FT. DODGE
IOWA

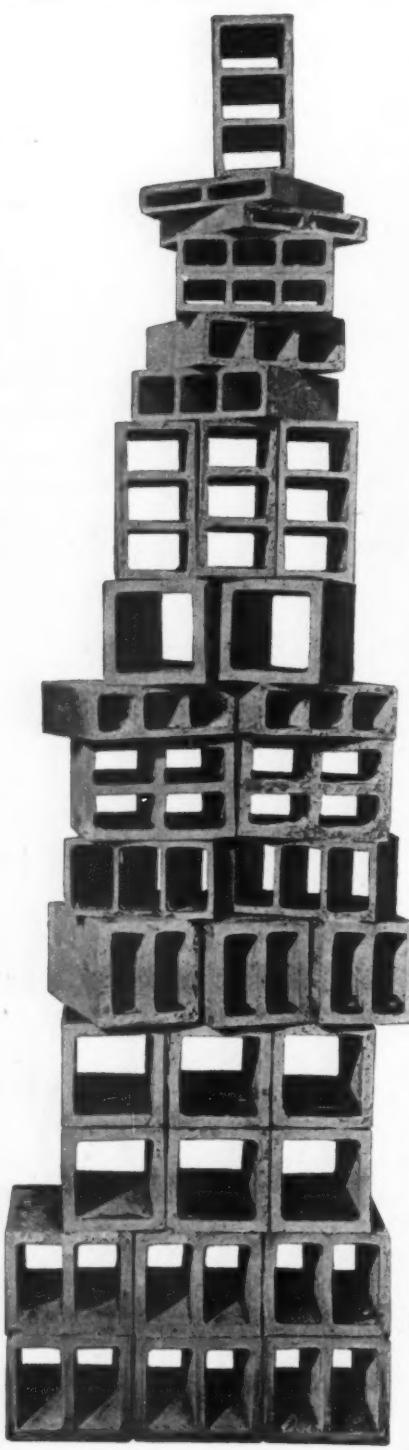
**PLYMOUTH
CEMENT
AND
WOOD FIBER
PLASTER**

The Brand that's Made from Pure
Gypsum Rock.

WRITE US FOR PRICES AND
ADVERTISING MATTER.

Plymouth Gypsum Co.
Fort Dodge, Iowa





**Our 1910
Catalog**

Gives the method of manufacture, fire and compression test data, and the endorsements of local architects and other building authorities. Also many other articles and illustrations of interest to the general public. May we send you, postpaid, a copy of our Catalog?

**The Concrete Stone & Sand Co.
Youngstown, Ohio.**

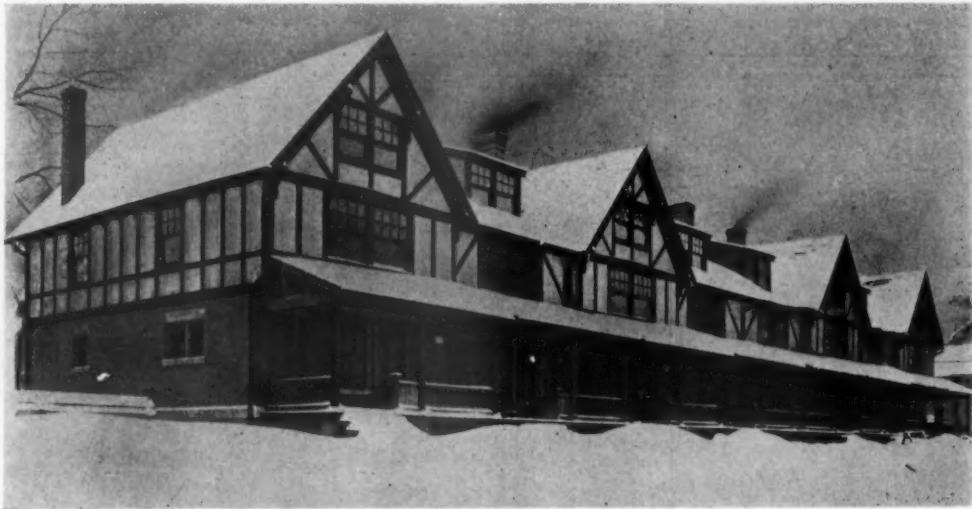


**Has The First *Pauly* Concrete
Tile Plant Been Successful?**

This question, which is usually first asked us by interested parties, is best answered by two facts:—1. During the year of 1909, the demand in Youngstown, Ohio, could not be satisfied, and (2) the plants capacity output is sold until the middle of the summer of 1910, in the City of Youngstown alone. In this connection it might be stated also that 4 tiles of our most common size, 8x8x16, can be manufactured from one cubic foot of concrete, with a labor cost of 50 per cent of the cost of concrete anywhere east of the Mississippi.

A weatherproof home of fireproof material can now be built for almost wooden construction cost. These points have been clearly demonstrated in Youngstown by practical use of *Pauly* Concrete Structural and Fireproofing Tile, in a variety of buildings. The result gained has not only been a financial success, but also an enviable position in the estimation of the entire building public.

Persons interested in this practical and profitable phase of the concrete business, are always welcome to the The Concrete Stone & Sand Co., Youngstown, Ohio, where they will be shown every detail of the initial factory.



Tell 'em you saw it in ROCK PRODUCTS

ANNOUNCEMENT

We are just closing our second year and are pleased to say, the high quality of our various products, together with our unexcelled service, has made so many friends for the "NIAGARA" brand of

Wood Fiber Plaster	
Neat Cement Plaster	Sanded Wall Plaster
Finishing Plasters	Stucco

that it has been necessary to increase the capacity of our Oakfield Mills. This has been done, and we therefore offer our many patrons and the trade generally **QUALITY, SERVICE and CAPACITY** sufficient to enable us to handle any volume of business promptly, and we would appreciate your order.

NIAGARA GYPSUM COMPANY
Mills: Oakfield, N. Y. Office: Buffalo, N. Y.

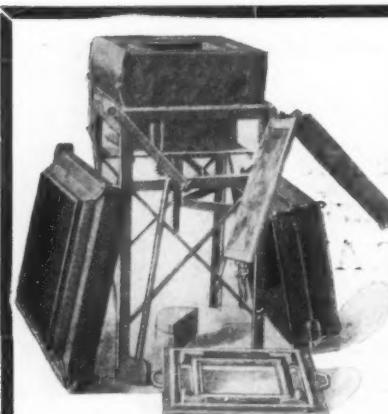
RETARDER Wood Fiber

**THE OHIO and BINNS RETARDER CO.
PORT CLINTON, OHIO**

Reliable Stucco Retarder=Strong=Uniform in Strength=

Duplicate power plant (electric and steam power) installed so as to preclude any possibility of shut down and consequent shut down of mixers who depend upon us for their supply of Retarder. We have a capacity large enough to supply every retarder user in the U. S. and Canada, and some to spare for Europe. Our mills are fireproof in every particular. Write us for prices and information.

**THE OHIO and BINNS RETARDER CO.
PORT CLINTON, OHIO**



A MONEY MAKER
LEARNER CONCRETE
FLUE MACHINE

This machine makes double ventilated fire proof chimney blocks, as nine years of severe tests have proven.

You can produce two sizes of flue linings suitable for lining brick chimneys, either one or two at each operation.

You can also make porch columns, piers and lattice work on the same machine.

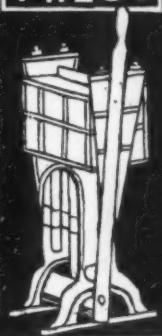
Beautiful line of ornamental molds for porch columns and balusters.

We manufacture a high grade line of concrete machinery and edged tools at low prices.

WRITE US YOUR WANTS

The P. H. LEARNER CO.
KOKOMO, IND.

WHY PAY MORE?

PRESS


100,000 Pounds Pressure

A Hand Lever Concrete Press at a Modest Price

MAKING
HOLLOW VENEER HEADER-BOND BLOCKS and Brick

Collapsible Steel Culvert Forms

CATALOGUE FREE

AMERICAN CEMENT MACHINERY CO., St. Louis, Mo.

SYSTEMATIC CONCRETE MIXER

28 Advantages—Unequaled. WON 180 different times in competition.

For any proportion, any material, lock proportions with slide rule and key. Horizontal drive, high wheels, low hoppers, cement hopper holds 156 lbs. hard metal paddles, 10 gauge steel mixing barrel, steel axles, best engine made. See it at Spaces 181 and 182, coming Chicago Cement Show, Feb. 18 to 26, 1910. Also see Cheapest and Best Block and Brick Machines made.

The SYSTEMATIC leads. Investigate and profit thereby. Get new Catalog "R."

CEMENT MACHINERY CO.
JACKSON, MICH.

1910 Model Now Ready

Tell 'em you saw it in ROCK PRODUCTS

DOES IT PAY?

HE Concrete Sand and Stone Co., of Youngstown, Ohio, is running a full page advertisement monthly in ROCK PRODUCTS. Here's what Manager A. A. Pauly says about it:

"We get enquiries from all over the world and are satisfied that ROCK PRODUCTS has been instrumental in aiding our business materially, because during most of our business career it is the only paper we have used."

"We consider that ROCK PRODUCTS reaches the people, and is in close personal touch with the men 'behind the guns.' We have recently closed a contract with Buenos Ayres manufacturers which already amounts to \$30,000, and probably will exceed five times this amount, as a direct result from our ad. in ROCK PRODUCTS."

"We figure that the personal co-operation of your editorial and field forces has been instrumental with our general publicity in ROCK PRODUCTS, in placing several hundred thousand dollars worth of business."

Does It Pay?

Ask Mr. Pauly. His address is Youngstown, Ohio. There are others of whom similar information may be obtained. Lots of 'em. We'll tell you about them later.

Rock Products

355 Dearborn Street, CHICAGO

Concrete Blocks

MADE BY CENTRIFUGAL FORCE

Strictly a High Class Factory Proposition

Speedy and Economical. The machine does all the work except the original mixing and piling up the finished product.

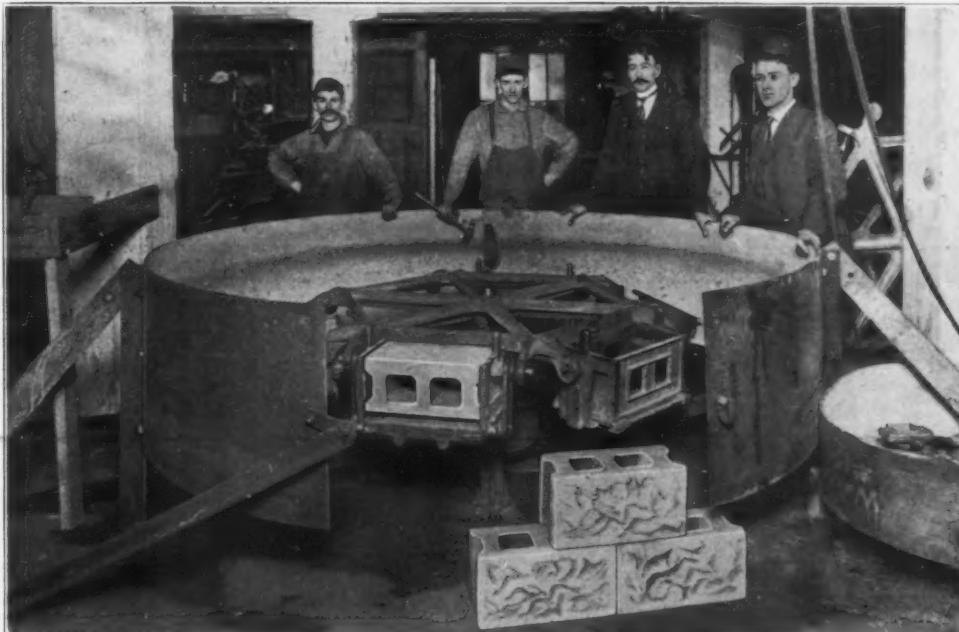
No Tamping. The mixture is poured into the moulds, then revolved rapidly, producing a pressure of thousands of pounds, uniformly, on every part of the block. The excess water is then extracted as a fine mist, and in about sixty seconds the blocks are ready to be removed from the moulds.

The Way it is Done. Take a West Slush Mixture of Portland Cement with any suitable aggregate and after a thorough mixing pour into the moulds successively until all are filled. Then throw the belt upon the service pulley for one minute or less at a high speed with the development of tremendous pressure in the fully perfected Centrifugal Machine. Remove the finished blocks from the molds and leave them on the pallets for a few hours. The blocks are then ready for storage in the yard or can be used in the wall within 12 hours. Fully protected by patents. Standard size machines in operation more than 2 years.

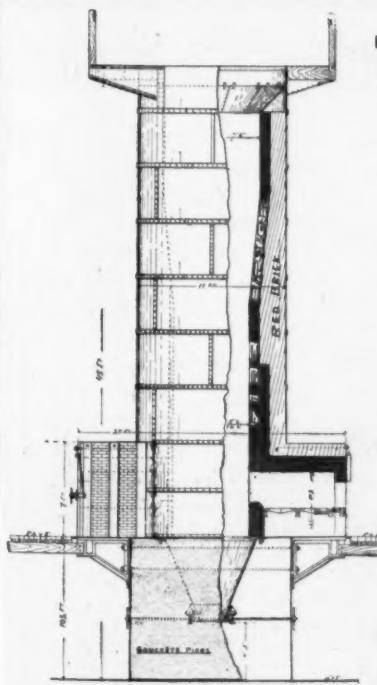
See Our Exhibit At The Chicago Cement Show
Balcony, Space 270 South End

Centrifugal Concrete Machine Company

805 Corn Exchange Bank Bldg.
CHICAGO, ILL.



This machine makes 600 blocks in a 10-hour day, 8"x8"x16"



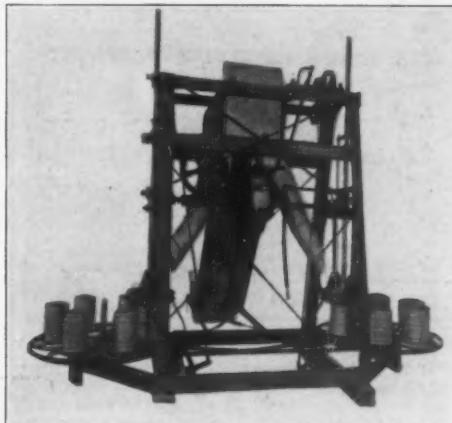
The Broomell Steel Shell Lime Kiln

This Kiln is identical in size and capacity, and all castings, cooling cone, rock storage, etc., are just the same as in my reinforced concrete kiln.

No better lime kiln than this was ever made.
Price is low.

A. P. Broomell, Manufacturer
YORK, PENN.

THE McCracken Double Tile Machine



The McCracken Double Tile Machine makes all sizes of cement tile from 4 to 16 in. in diameter at the rate of from 10 to 20 tile per minute. Also makes building blocks or construction tile 8x8x16 at the rate of 2000 to 3000 per ten hour day.

The machine will make two different sizes of tile at the same time or building blocks and tile at the same time, or either end of machine can be used without using the other.

The machine has no cams and runs just as smooth at high speed as when running slow. Takes less labor per 1000 tile than any other machine.

Tiles are packed so hard that the large sizes can be carried without the use of pallets. Machine is very simple and strong and runs very light, and elevator can be started and stopped without stopping the machine.

See the McCracken Machine before you buy. Write to
The Sioux City Cement Machinery Company
219 4th Street, SIOUX CITY, IOWA

The Reason Why

THREE is a specific reason WHY you should purchase the Schenk Cement Drain Tile Machine—a specific reason WHY the Schenk should operate in your factory. Put into the plainest possible English, the reason WHY is that the Schenk operates in more factories than all other makes combined. You are not to compare it with other machines, for it is the pioneer, it has stood the test, it has passed the experimental stage and is a positive and established success—that is the reason WHY.

This year we have an extraordinary good proposition for two hundred (mind you, only two hundred) good, live, energetic concrete men who wish to establish

themselves in a paying business with but a small investment. Your name on a postal card entitles you to the inside facts—mail it to-day.

Our Machinery will not be on exhibition at the Chicago Cement Show, but come anyway and have a talk with our representative at booth No. 256.

**—The Cement—
Tile Machinery Company**

740-45 Rath Street

WATERLOO, IOWA



McIntosh Automatic Sand-Cement Brick Machine

Weight, 11 tons.

Guaranteed Capacity, 20,000 per day.

As the McINTOSH works entirely automatically, if the material and pallet hoppers are kept supplied, the guaranteed output is assured.

Makes eight (8) brick on a pallet
at each revolution, and puts the
same TREMENDOUS PRESSURE
on every brick.

Send us the cost of Sand, Cement and labor in your vicinity and we will give you the approximate cost of manufacturing SAND-CEMENT BRICK with our equipment.

Write for our new catalogue describing our machine and the complete installation of a modern Cement Brick Plant, also valuable information regarding the manufacture and curing of Cement Brick.

Oklahoma & Texas Cement Brick Co.

Tell 'em you saw it in ROCK PRODUCTS

Cement Sewer Pipe Is the Large Profit End of the Concrete Business



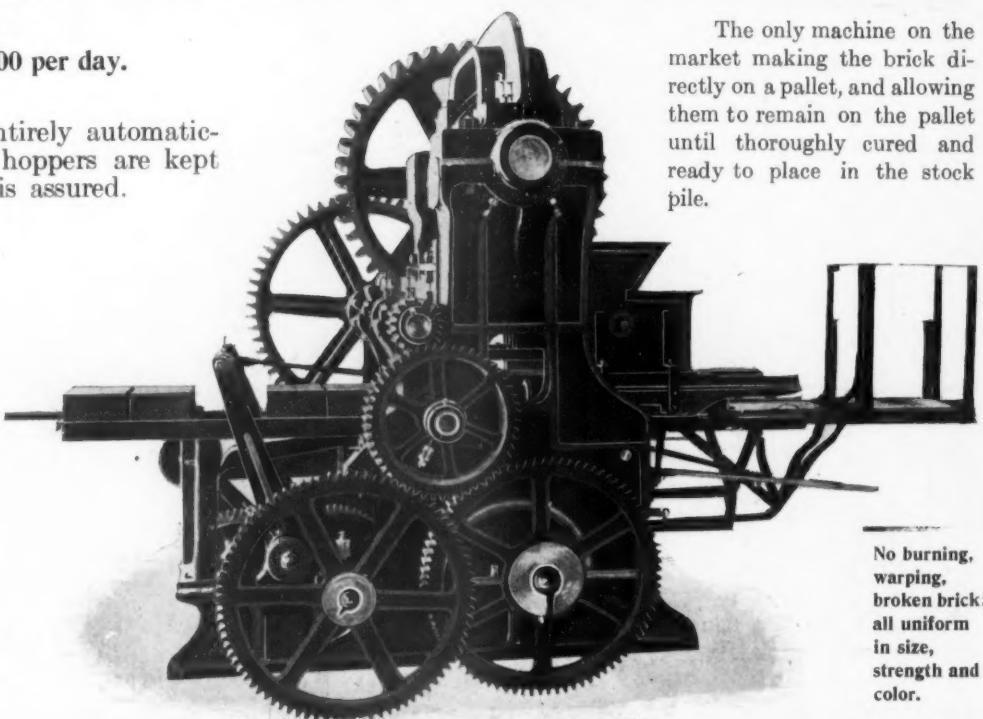
Miracle Cement Pipe Molds have been in general use throughout America and many foreign countries for the past five years, and are giving universal satisfaction. Within the past three months large plants have been equipped for the manufacture of cement pipe by the use of Miracle molds, in the cities of Denver, Tacoma and Seattle, which cities have opened their specifications to the use of cement sewer pipe.

Special Sewer Pipe Catalog Just Out.
Sent FREE to Readers of this Magazine.

MIRACLE PRESSED STONE CO.

Department "Z"

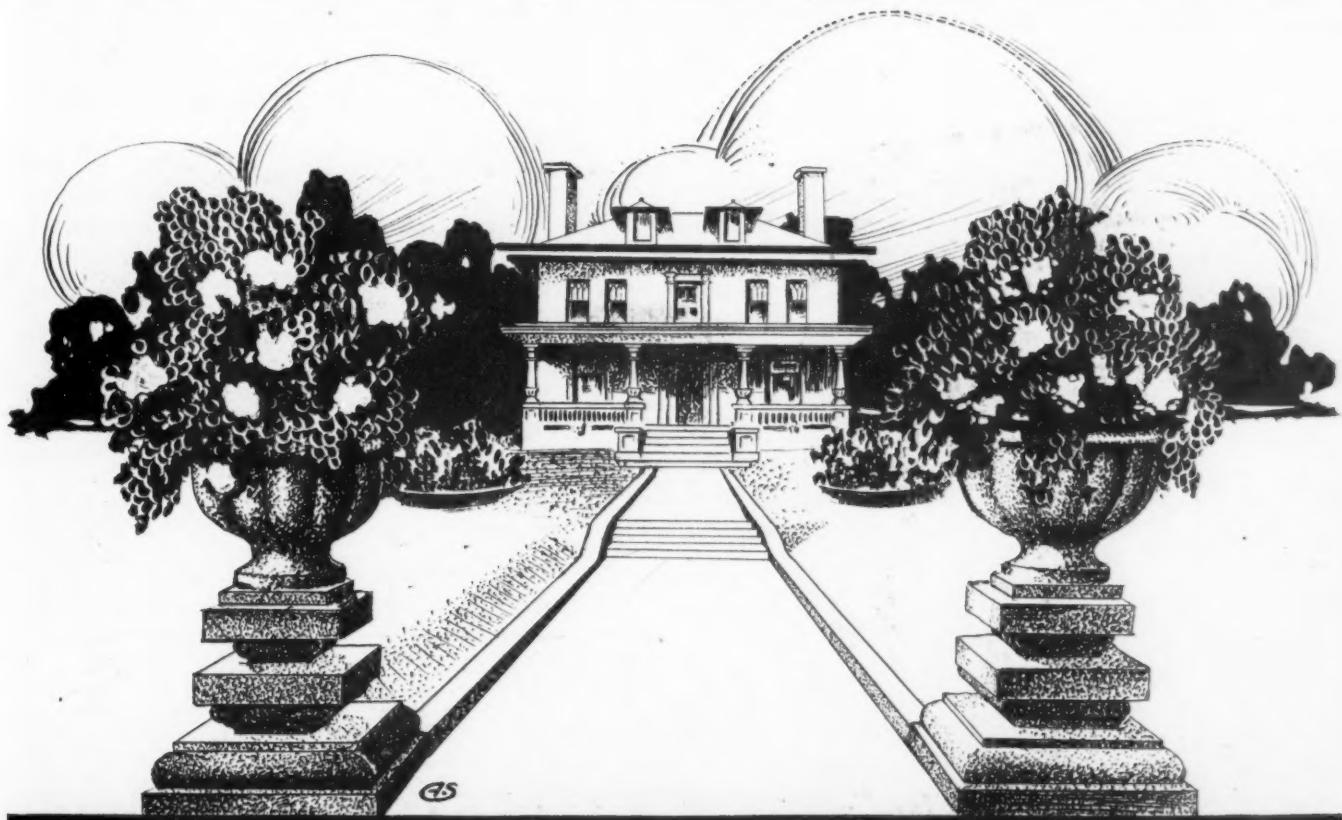
Minneapolis, Minn.



The only machine on the market making the brick directly on a pallet, and allowing them to remain on the pallet until thoroughly cured and ready to place in the stock pile.

No burning,
warping,
broken brick;
all uniform
in size,
strength and
color.

OKLAHOMA CITY
OKLAHOMA, U.S.A.



Simpson Molds at the Chicago Show

COLISEUM, CHICAGO, Feb. 22, 1910, 9:30 p. m.

TO ROCK PRODUCTS READERS:-

Among the crowds of visitors at the great show during the first three days, ending tonight, there has been a throng of owners of Simpson Molds. More than three hundred of them have already registered their attendance at our booth. They come from Massachusetts and Florida, from Washington and Utah, and from almost every state within the square of which those states form the corners. But the **BEST PART OF THE STORY** is that they all bring splendid reports of results accomplished and business done in porch work during the past year. Many of them have brought along photographs of Simpson Porches they had erected last season. Our space has been the scene of an almost continuous session of what might be called a

National Association of Simpson Mold Users

who have discussed among themselves their ways of building fine concrete porches and of forming new and attractive combinations of blocks produced from Simpson Molds. They have exclaimed "Oh, Fine!" over the new lawn vase and the other new things we have shown them, and they have, during the three days, ordered more of the new molds than we had expected to sell during the whole show—which, at this writing, is not yet half over.

At the same time, hundreds of other cement users have inspected our display of columns, newels, pedestals, balustrades, hitching posts, grave markers, flower urns, etc., and have critically examined the molds in which they were made, with a result that it is certain sales for the week will reach at least 1500 molds, which will

More Than Double Any Previous Cement Show Record

Now, of course, all this shows plainly that the men who know by experience what Simpson Molds will do for them are the best friends of Simpson Molds, and also that those who see them for the first time know at once that they are splendid equipment for any Block Maker to have.

Meanwhile, we will tell you all about Simpson Molds if you will write us. We ask that you send some kind of printing showing that you have a live business interest in the subject. Then we will know that you belong in our "preferred list" for mailing our finely illustrated literature as it is issued from time to time.

The Simpson Cement Mold Co.
140 East Spring Street, COLUMBUS, OHIO

Anchor Concrete Block Machines

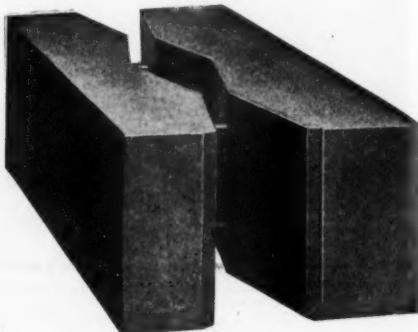


THEY HAVE STOOD THE TEST OF TIME AND MADE GOOD,
WITH A PROFIT TO THE USER, TOO.

Anchor continuous air space blocks guaranteed frost and moisture proof.

Anchor blocks are bound together with firm $\frac{1}{4}$ inch galvanized iron rods 8 inches long and turned one inch at each end.

Standard Anchor Machines make blocks that lay in the wall 8 in. by 24 in., any width from 8 in to 12 in.



THE FAMOUS ANCHOR BLOCK.
ENDORSED BY ARCHITECTS EVERYWHERE.

Anchor Jr. Machines make blocks that lay in the wall 8 in. by 16 in. and any width from 8 in to 12 in.

**ONE ANCHOR MACHINE, PLUS ENERGY, BACKED
BY A LITTLE CAPITAL, MEANS THE PRODUCTION OF
HIGH-GRADE BUILDING ALWAYS IN DEMAND.**

WRITE FOR CATALOGUE AND PRICES.

ALL MACHINES SOLD DIRECT TO THE TRADE.

Anchor Concrete Stone Company
ROCK RAPIDS, IOWA

KELLASTONE PURE WHITE PLASTIC STONE

Applied on wood or metal skeleton frame, inside and outside walls, porch complete, steps and columns.

**Water Proof
Fire Proof
Acid Proof**

Imagine a house without a crack or crevice. No carpets; floors and base one piece. Rug center with colored border.



KINTZ DWELLING, South 7th Street, Terre Haute, Ind.

Main Factory

Address

Architects can let their fancy run wild. Kellastone can be applied on any shape or form, wood or iron. Twenty-five shades or colors.

Branch factories will be established throughout the United States.

Main Office

Sanitary Construction and Manufacturing Co.
TERRE HAUTE, IND.

Tell 'em you saw it in ROCK PRODUCTS

TRIUMPHANT

THE ACME OF PERFECTION AT LAST

The Improved PEERLESS One Man Cement Brick Machine

Equipped with a new tamping device which tamps ten bricks in the machine at one operation, making 12,000 perfectly formed bricks in ten hours.

The most successful and most easily operated one man brick machine ever made.

The Peerless was Triumphant at the Cement Show of 1909; it has scored a greater Triumph at the 1910 exhibition.



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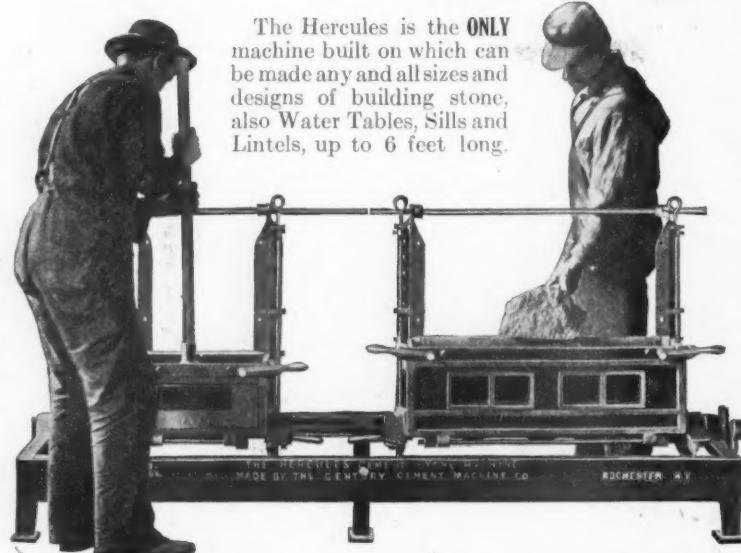
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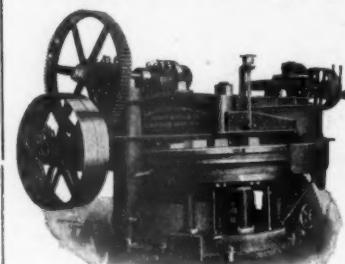
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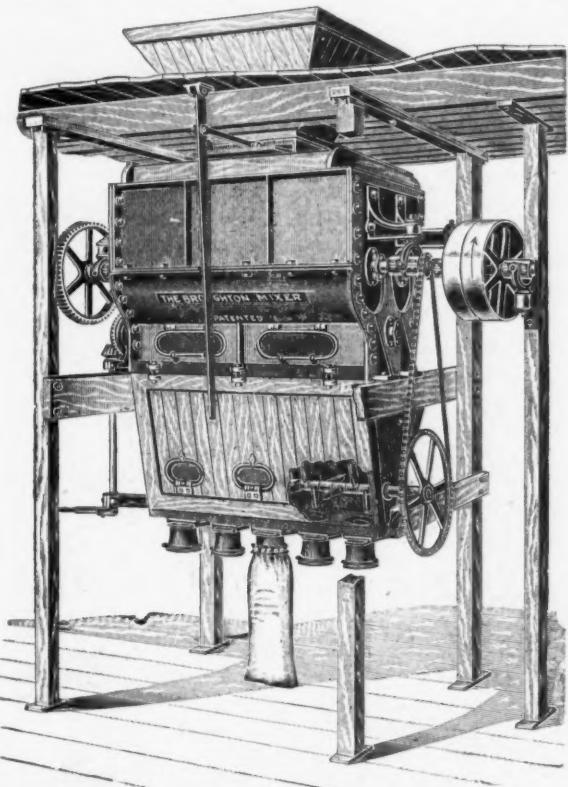
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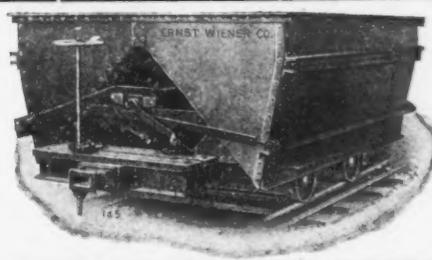
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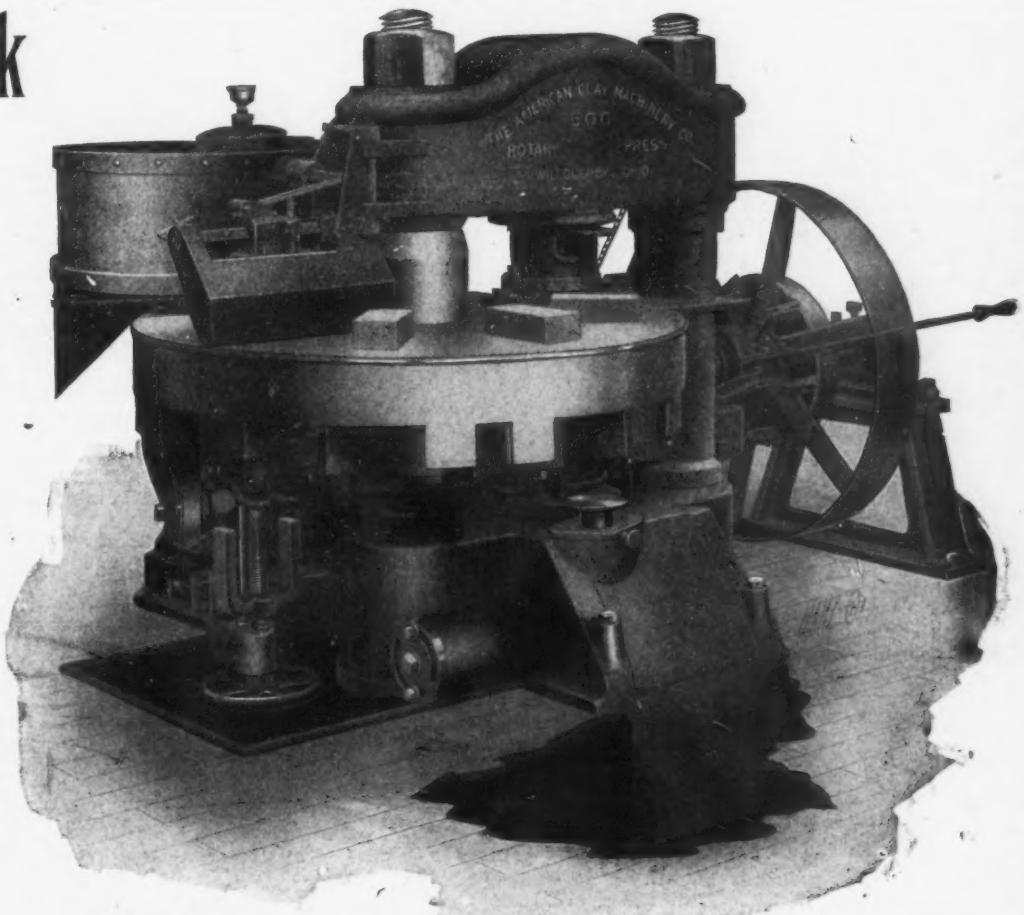
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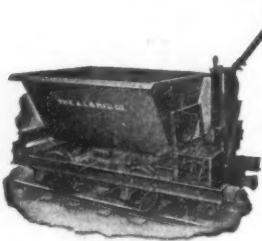
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